247

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2, SET 183

Bendix Models 0AK3, 21KD, 21T3 and 21X3 (Ch. T14-1) were covered in Photofact Folder 2, Set 183. Models KB21C, KM17C, KM21C, TB21C, TM17C, TM21C and 21T3A (Ch. T14-1) have now been added to this group. These models are electrically identical to the models covered, except models KM17C and TM17C use a 17" picture tube and model 21T3A uses a different tuner (part #RH258051-1). A schematic of this tuner is given on the next page.

In later production the following changes were made in Ch. T14-1.

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Chassis T14-1 Coded A

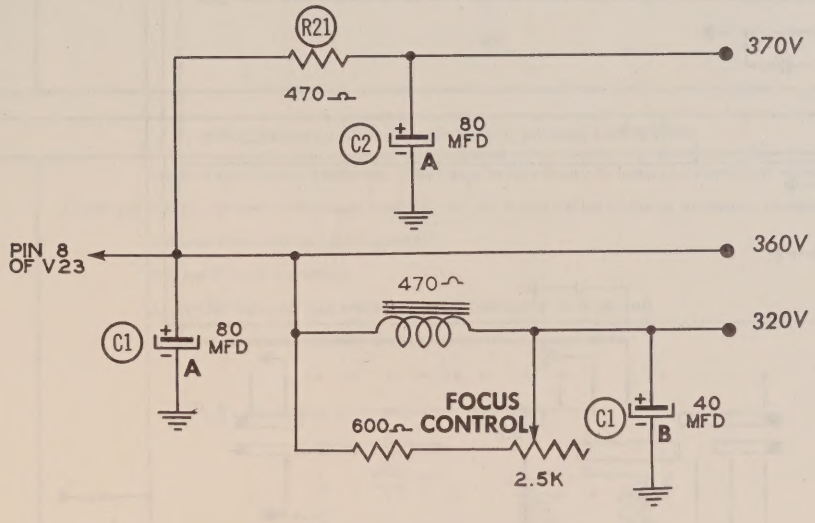
COMPONENT CHANGES

In later production R73, 150Volt line, bleeder resistor was omitted and R46 was changed from 470Ω to 2.7KΩ.

Chassis T14-1 Coded B

ELECTROMAGNETIC FOCUS PICTURE TUBE USED

In later production an electromagnetic focus picture tube (17QP4A or 21EP4A) is used. When these tubes are used the filter choke is replaced by a focus coil (part #NH265045-8) with a 2.5KΩ,4watt focus control (part #CH262023-9) and a 600Ω, 5watt resistor connected in parallel with it as shown in the partial schematic below and the focus control (R4) and R118 as shown in Photofact Folder 2, Set 183 are omitted.



BENDIX MODELS KB21C, KM17C, KM21C, 0AK3, TB21C, TM17C, TM21C, 21KD, 21T3, 21T3A, 21X3 (Ch. T14-1).

PRODUCTION CHANGES
BULLETIN 101

PRODUCTION CHANGES
BULLETIN 101

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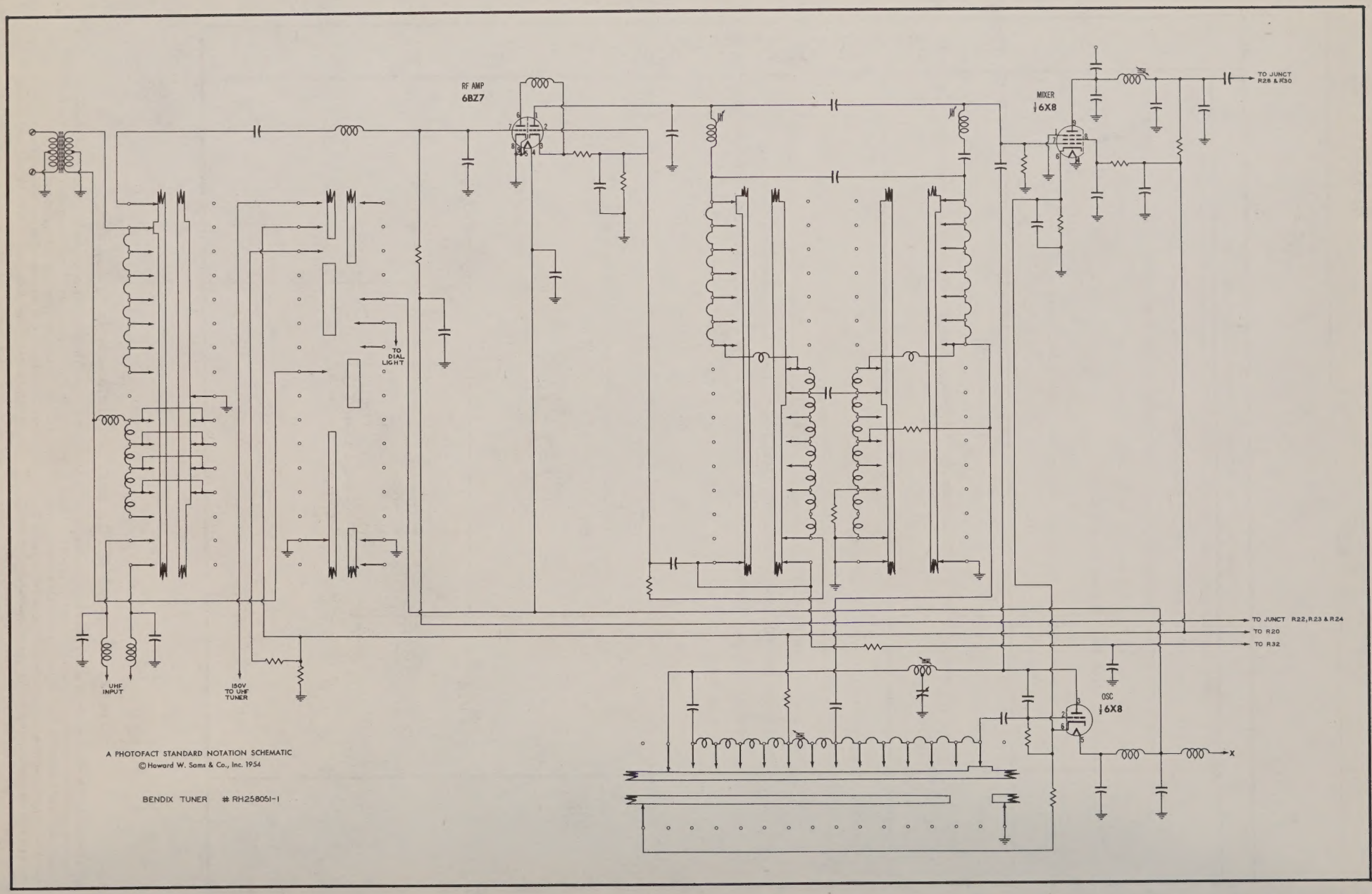

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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BENDIX TUNER # RH258051-1

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 15 IN SET 228

RCA Victor models 17-H-2D, 17-H-2E, 17-S-349G, GU and 17-S-350G, GU have now been added to the group of models covered in Photofact Folder 15, Set 228. They are identical to the models covered, except, for the following items.

Models 17-S-349G 17-S-350G

Models 17-S-349G and 17-S-350G (Ch. KCS78M) are identical to models 17-S-349 and 17-S-350, respectively, except, a glass (17QP4) picture tube is used.

Models 17-S-349GU 17-S-350GU

Models 17-S-349GU and 17-S-350GU (Ch. KCS78L) use the 17QP4 picture tube and the KRK29A/27 tuner. A schematic of this tuner is given on page 20 in Photofact Folder 15, Set 228.

Models 17-H-2D 17-H-2E

Models 17-H-2D and 17-H-2E use the 17QP4 picture tube and the KRK29 tuner.

In addition, the following changes were made.

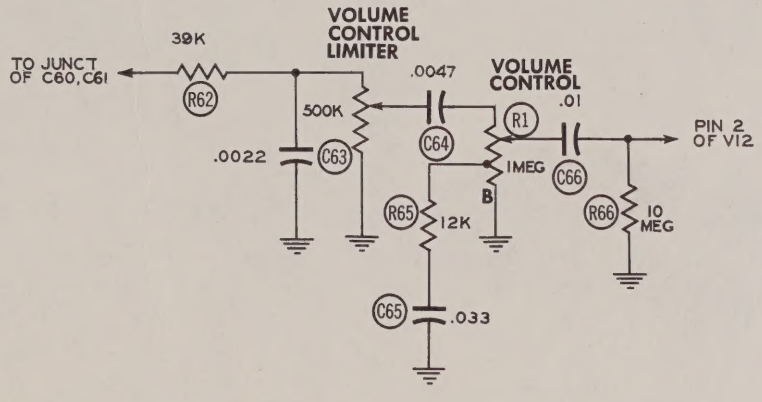
A 5" PM speaker (part number 77000) is used.

C111, high voltage filter capacitor, is omitted.

The TV-Phono switch (M8) and the phono-jack are omitted. When the switch is omitted, pin 4 of V11 and pin 1 of V22 are grounded directly to the chassis.

Model 17-H-2E

Model 17-H-2E, also, contains a concealed volume control. This control may be adjusted to limit the volume level obtainable from the volume control on the front panel. A schematic of this circuit is given below.



RCA VICTOR MODELS 17-H-2D, 17-H-2E, 17-S-349G, GU, 17-S-350G, GU

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 8 IN SET 229

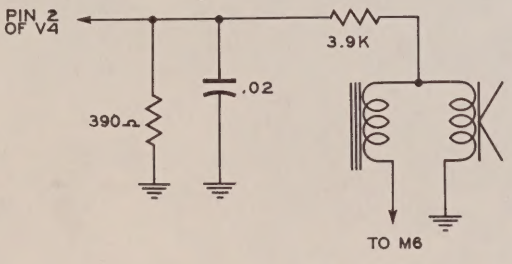
Packard auto models 439663 and 439666 used in 1954 Series 54 autos are identical to models 439338 and 439339, covered in Photofact Folder 8, Set 229 except for the following component changes.

R23 was changed from 3300Ω to 3900Ω.

C72 and R22 were omitted.

A .02MFD capacitor was added from pin 2 (cathode of V4 to ground).

A partial schematic, showing the revised circuit is given below.

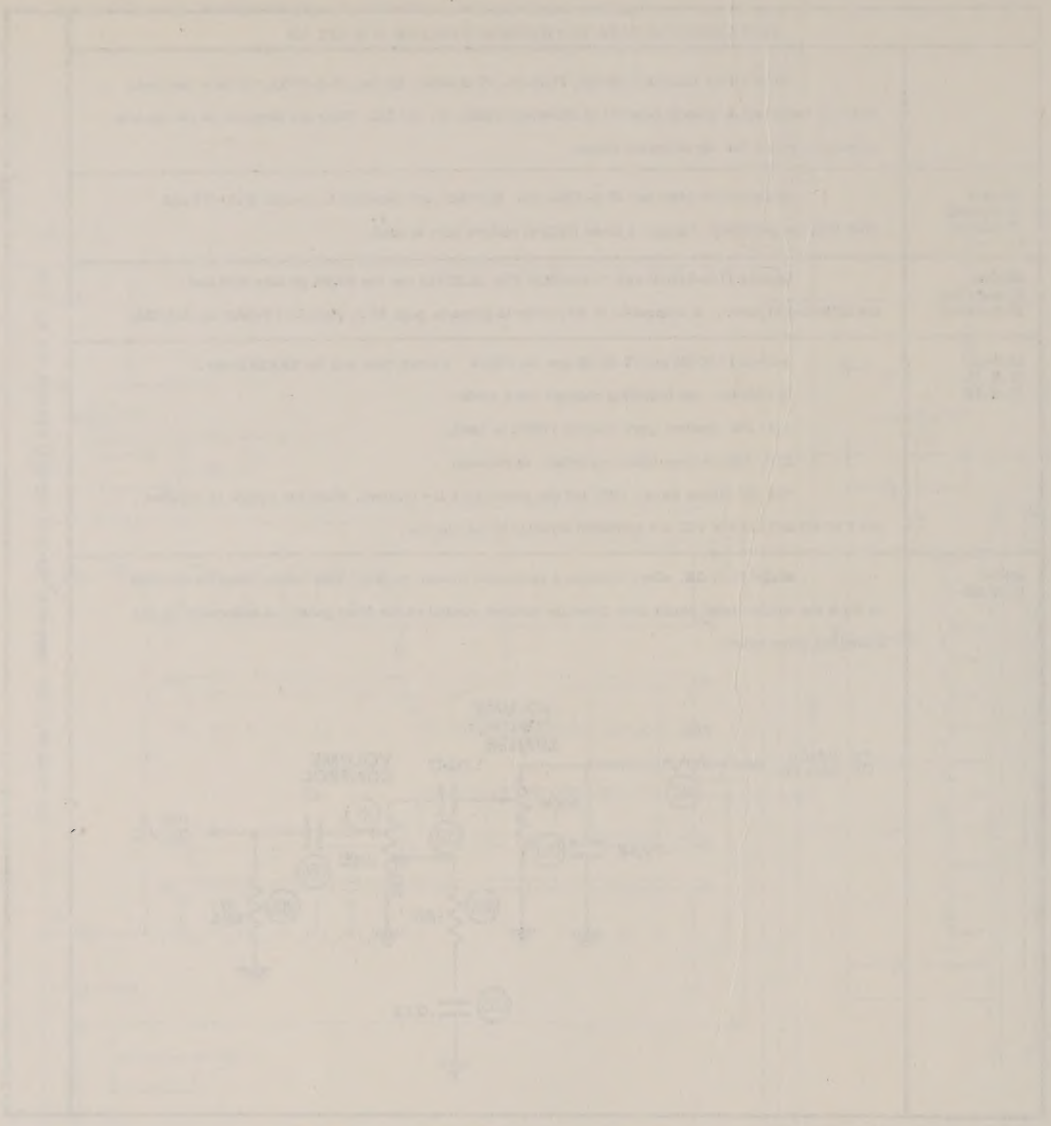


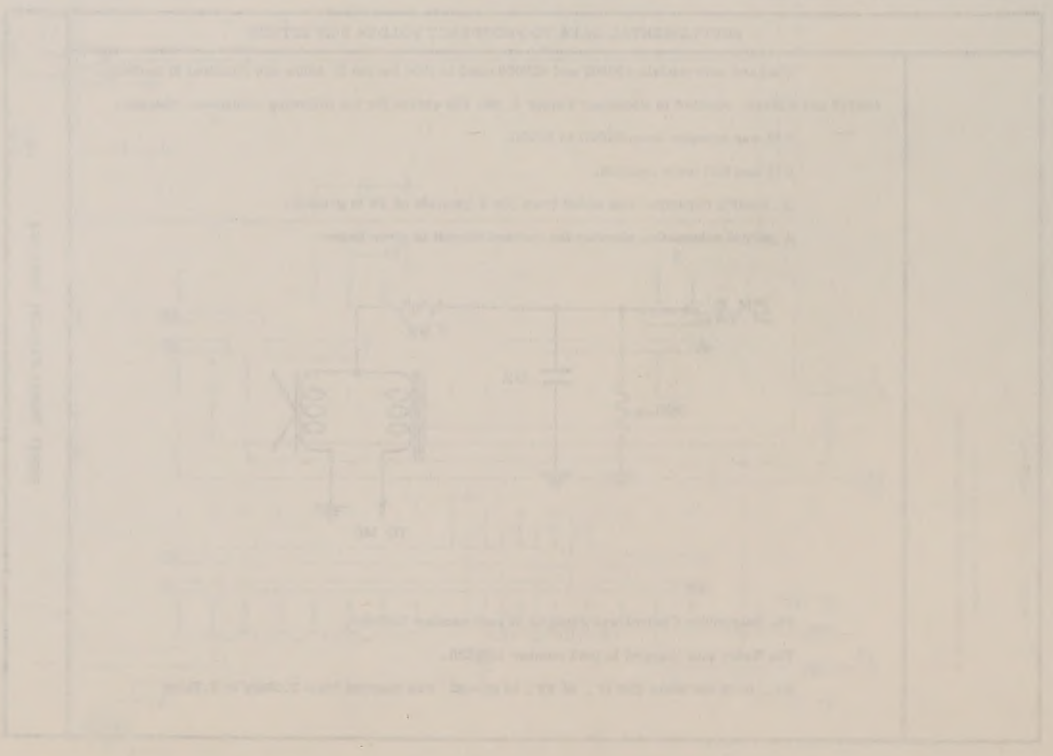
The Sensitivity Control was changed to part number 7265060.

The Relay was changed to part number 1220326.

R35, from the plate (pin 1), of V8, to ground, was changed from 3.3Meg to 5.6Meg.

PACKARD MODELS 439663, 439666





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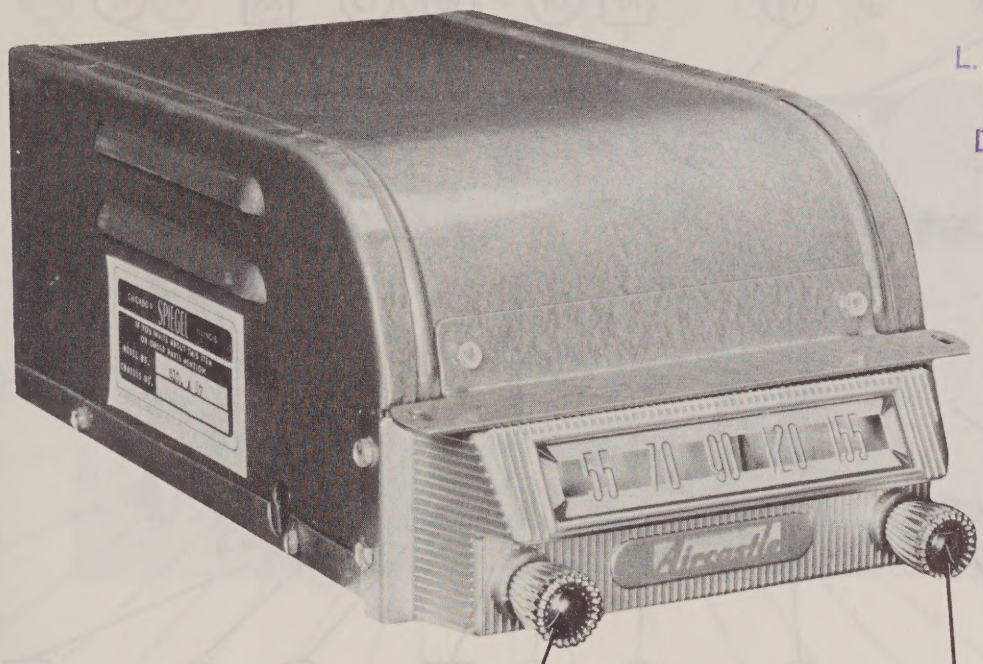
AIRCASTLE
MODEL 610.A67



TUNING CONTROL

VOLUME CONTROL ON-OFF SWITCH

AIRCASTLE
MODEL 610.A67

TRADE NAME	Aircastle Model 610.A67
SUPPLIER	Spiegel, Inc., 1061 W.35th. St., Chicago 9, Ill.
TYPE SET	Battery Operated Universal Automobile Superheterodyne Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery RATING 5.8 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	538-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

With tuning gang fully closed set dial pointer to the left edge of "55" on the dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400∿Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	100MMF	High side to antenna receptacle. Low side to chassis.	1600KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC signal	"	A6, A7	"
4.	"	"	600KC	Tune to 600KC signal	"	A8, A9	Adjust for maximum output. Repeat step 3.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det-AVC-AF Amp.	6AT6	6AT6	7BT	
V5	Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■20	350	CE-86	AFH3-107		C080		FP330	TVL-3636	
B	▲20	350								
C	20	25								
C2	.05	200	C207	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	.05	200	C207	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C4	.05	200	C207	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	100		CC200	S1100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C6A	220									
B	5000									
C	5000		♦	♦PA-113-2	♦PC-151	♦116TM2	♦1408-02		♦130C5	
D	250									
E										
C7	.01	600	C206	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C8	.5	100	C209	VHC-36		MP2P5		RF480	HC-1	
C9	.5	100	C209	VHC-36		MP2P5		RF480	HC-1	
C10	.008	1600	C205	P1688-008		CUB16D8		PT1628	MB-D8	

♦ Items C6A, C6B, C6C, C6D, C6E, R8A, R8B and R8C are combined in one unit.
When replacing items separately items C6D and C6E should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	750KΩ	½	RV-57	Q13-137	A47-750K-Z	B-70-S	U-51	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	1.2Meg	½		BTS-1.2 Meg	
R3	330Ω	½	R-303	BTS-330	
R4	22KΩ	2		BTB-22K	
R5	22KΩ	½		BTS-22K	
R6	1500Ω	½	R-314	BTS-1500	
R7	2.2Meg	½		BTS-2.2Meg	

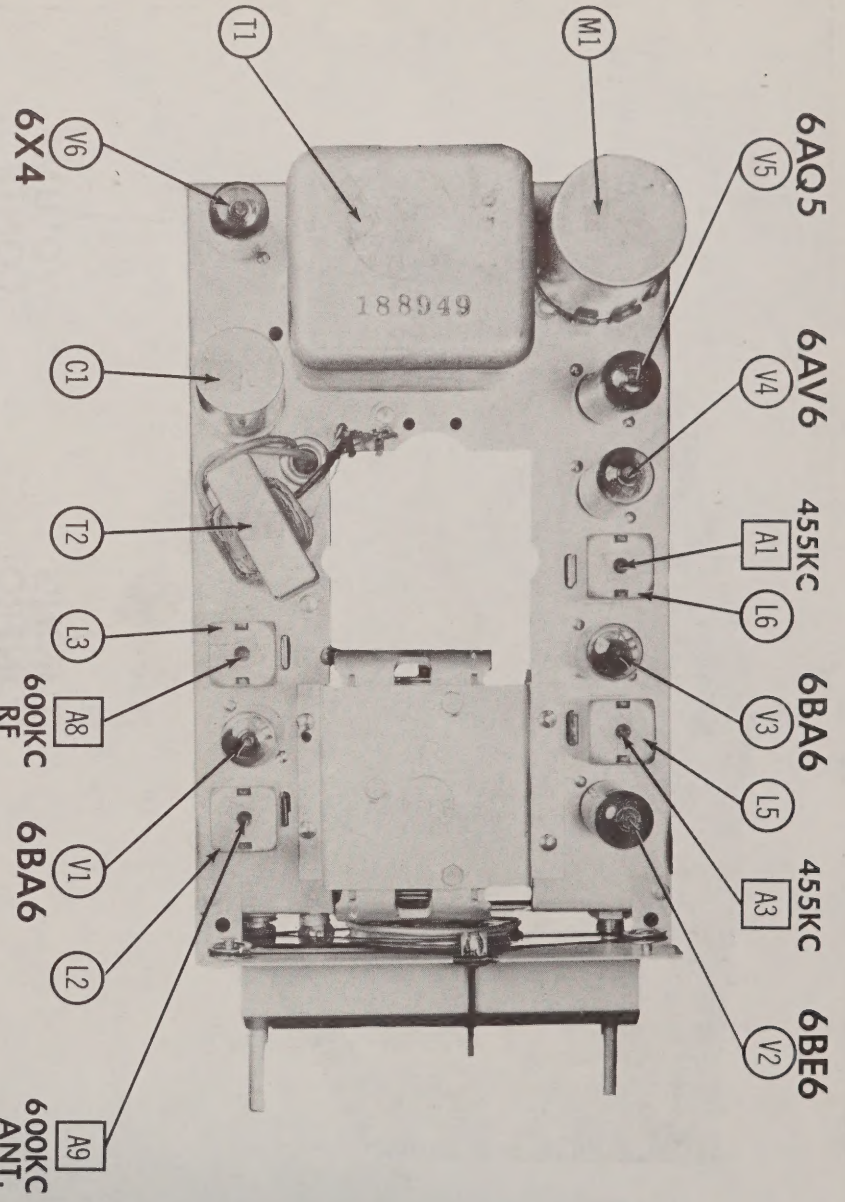
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R8A	6.8Meg	½		BTS-6.8 Meg	
B	470KΩ	½	♦	BTS-470K	
C	470KΩ	½		BTS-470K	
R9	330Ω	½	R-303	BTS-330	
R10	1000Ω	1		BTA-1000	
R11	100Ω	½	R-301	BTS-100	
R12	100Ω	½	R-301	BTS-100	

♦ Items R8A, R8B, R8C, C6A, C6B, C6C, C6D, C6F are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: AIRCASTLE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6.3VAC ② 3.5A	470VCT .051ADC					P-4078	V-16K	V-3803	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AIRCASTLE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	4.7KΩ	3.4Ω		A-3877	A-2930	S-3X	Z1001	TS-24S51	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.4Ω	PM-265	ST-105 Mod. P5-X	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AIRCASTLE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. RF Choke	1.2Ω		L200	19-1005 †		4624 †	Wound on 10MMF capacitor
L2	Ant. Coil	14Ω	4.8Ω	57FB-3				
L3	RF Coil	90Ω	6Ω	57FB-4				
L4	Osc. Coil	9Ω		L-210	14-1033 *	BC-381 *	71-Osc. *	Tapped @ .8Ω
L5	Input IF	18Ω	18Ω	1655-16	16-6758	BC-352	12-C1	
L6	Output IF	18Ω	18Ω	1655-16	16-6758	BC-353	12-C2	
L7	Fil. Choke	0Ω		L203		BC-537	5221	1.5 Microhenries
L8	Vibrator Hash choke	0Ω		L202		BC-537	5221	13 Microhenries

† Connect in series with 10MMF capacitor.
* Drill mounting hole.

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				AIRCASTLE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115∿	V-83	5301	859	5301	

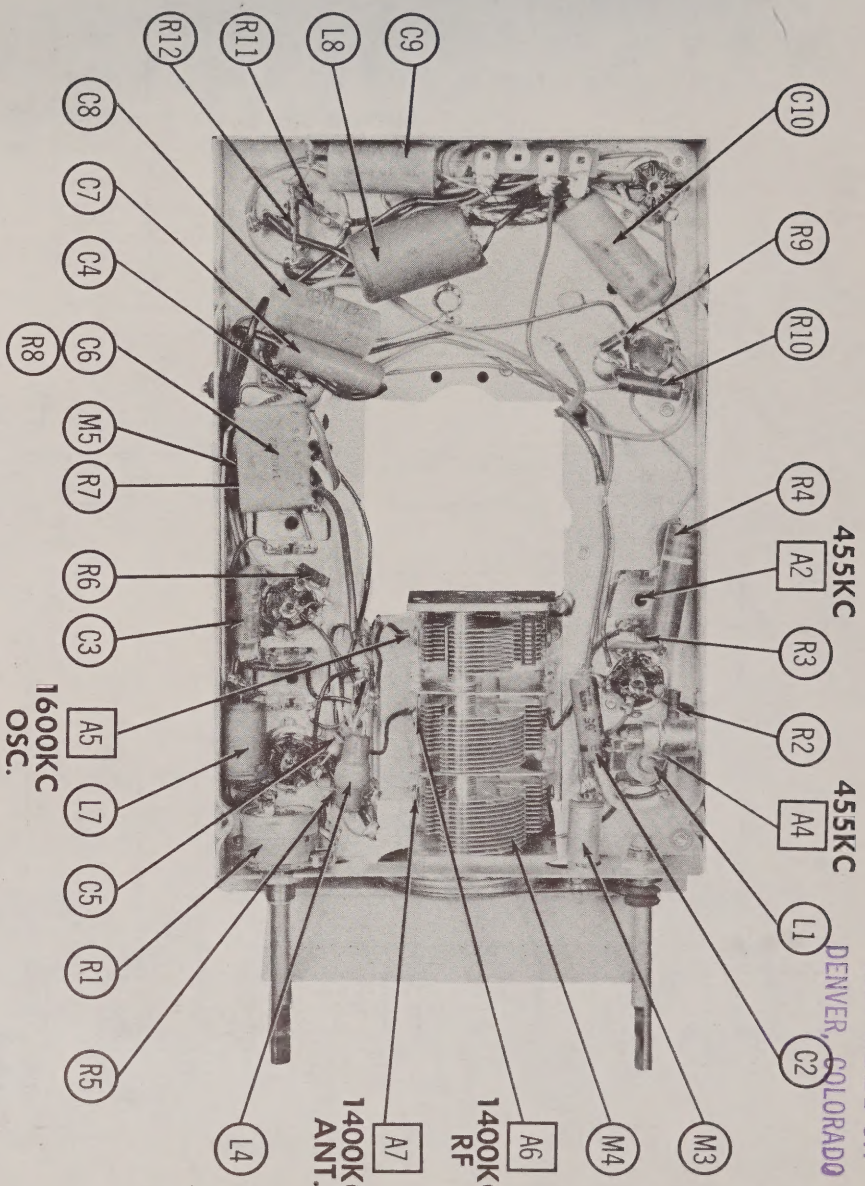
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AIRCASTLE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	A201	A300	307014 (SFE-14A)	155014	SFE14	HDI

MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M3	Dial light	T51	# 51 bayonet
M4	Tuning cap	CV-148	(23-387MMF, 23-387MMF, 40-204MMF)
M5	Spark plate		
	Knob	H508	2 used
	Dial scale	DP90M	

CHASSIS—BOTTOM VIEW



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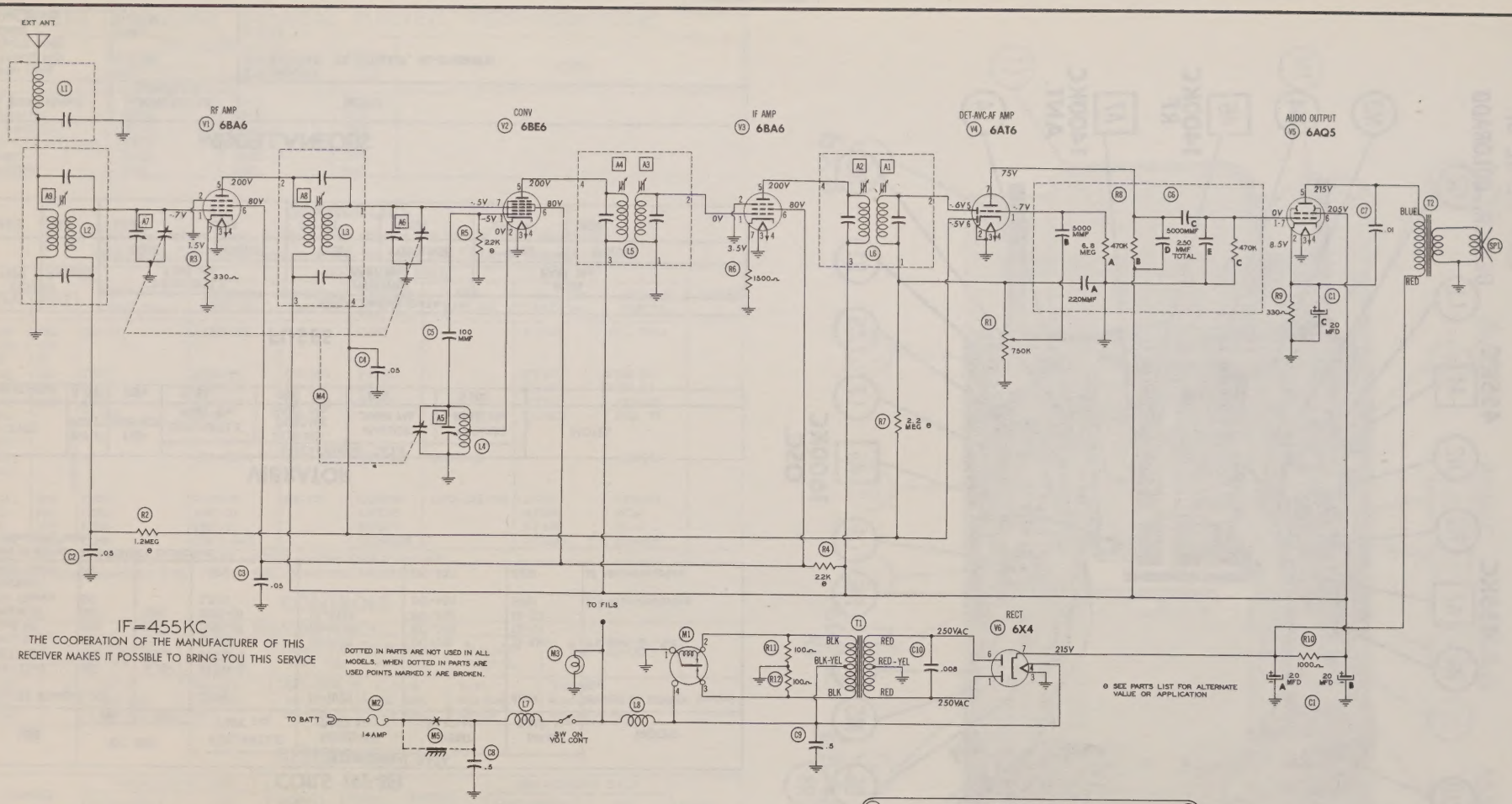
AIRCASTLE MODEL 610. A67

SET 247
FOLDER 2

AIRCASTLE MODEL 610. A67



IF=455KC

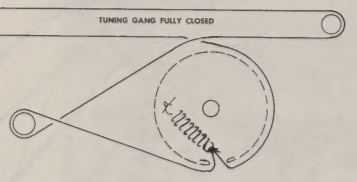
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	4.1Meg	0Ω	0Ω	.1Ω	†1KΩ	†23KΩ	330Ω
V 2	6BE6	22KΩ	.7Ω	0Ω	.1Ω	†1KΩ	†23KΩ	3.1Meg
V 3	6BA6	18Ω	0Ω	0Ω	.1Ω	†1KΩ	†23KΩ	1.5KΩ
V 4	6AT6	6.8Meg	0Ω	0Ω	.1Ω	750KΩ	3.1Meg	†470KΩ
V 5	6AQ5	470KΩ	330Ω	0Ω	.1Ω	†370Ω	†1KΩ	470KΩ
V 6	6X4	335Ω	INF	0Ω	.1Ω	INF	300Ω	150KΩ

† MEASURED FROM PIN 7 OF V6

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



DIAL CORD STRINGING

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RETMA MEMBER

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

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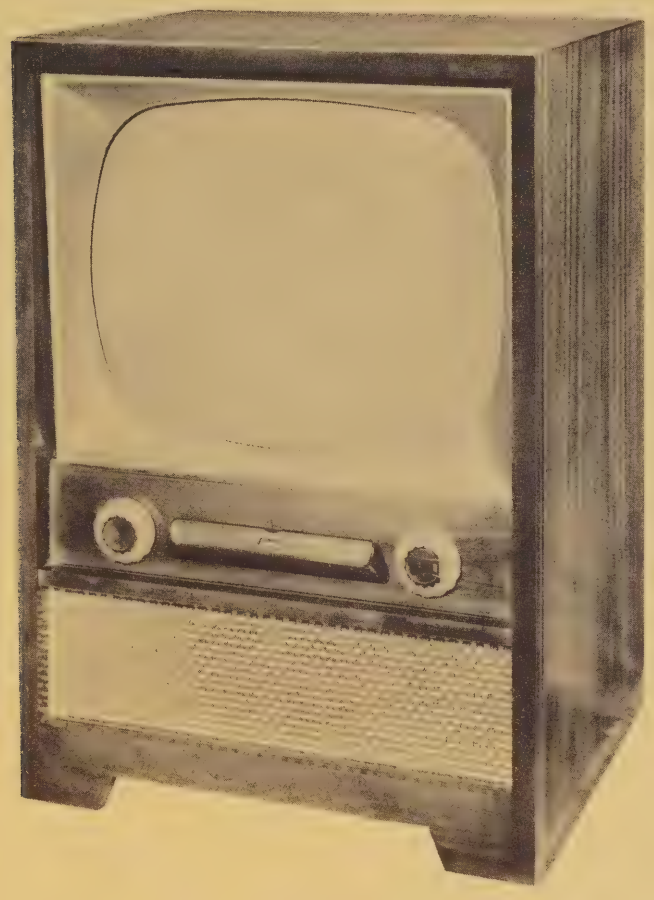

MODEL 9245CM-UHF

ARVIN
MODEL 9245CM-UHF (Ch. TE373-UHF)

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ARVIN
MODEL 9245CM-UHF (Ch. TE373-UHF)

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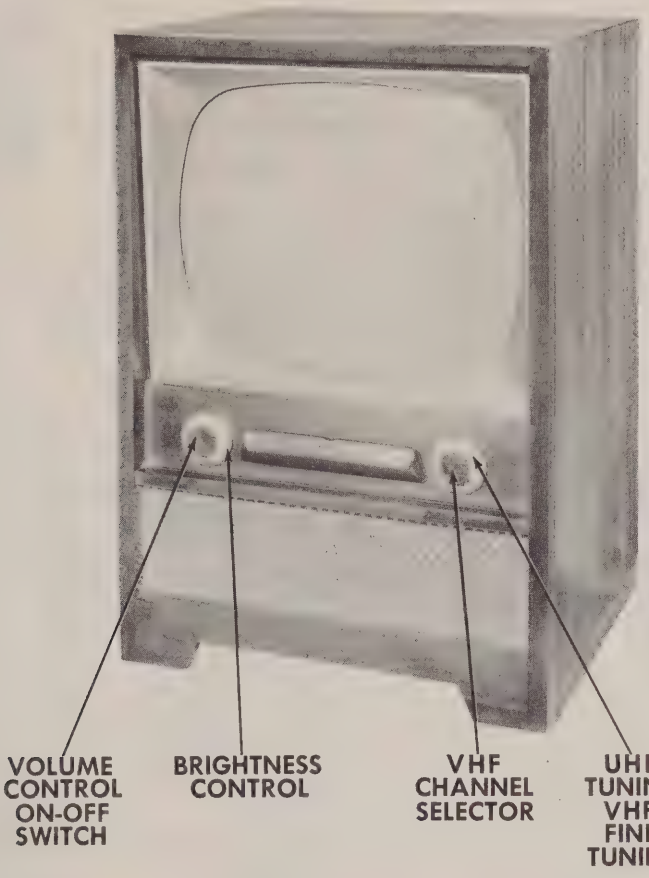
DENVER, COLORADO



ARVIN
MODEL 9245CM-UHF (Ch. TE373-UHF)

TRADE NAME	Arvin Model 9245CM - UHF (Ch. TE373-UHF)
MANUFACTURER	Arvin Industries, Columbus, Indiana
TYPE SET	Television Receiver
TUBES	Twenty-three

POWER SUPPLY 110-120 volts AC-60 cycle RATING 2.58 Amp. @ 117 volts AC
TUNING RANGE– Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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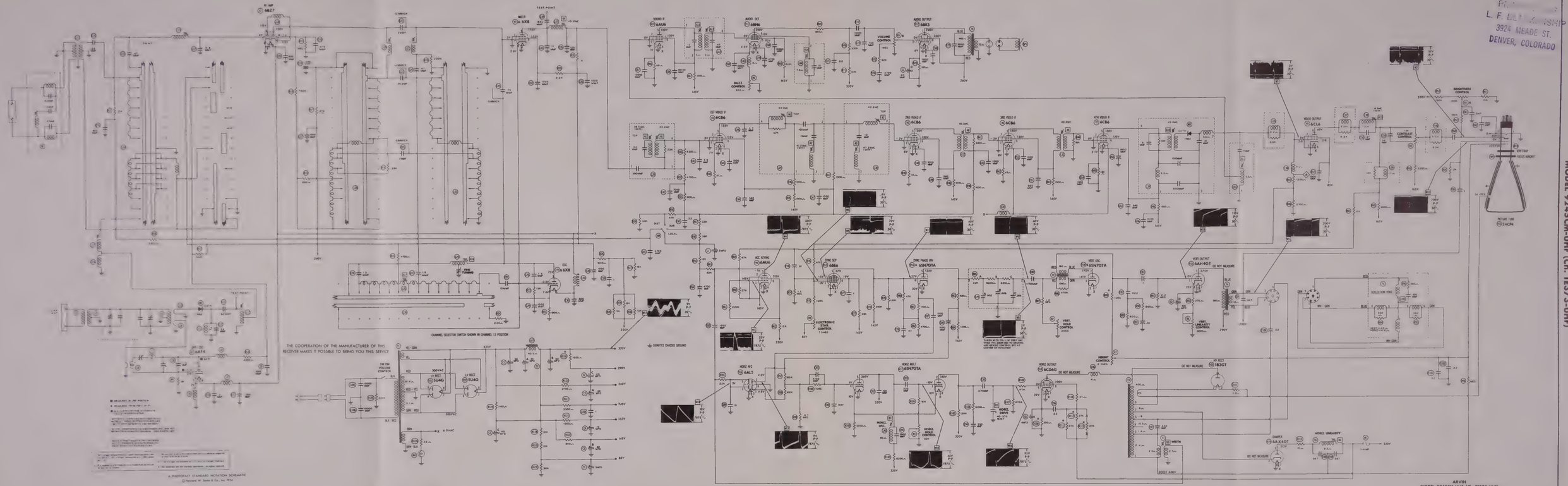
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
ARVIN
MODEL 9245CM-UHF (Ch. TE373-UHF)

L. F. [illegible]
3924 MEADE ST.
DENVER, COLORADO

ARVIN
MODEL 9245CM-UHF (Ch. TE373-UHF)

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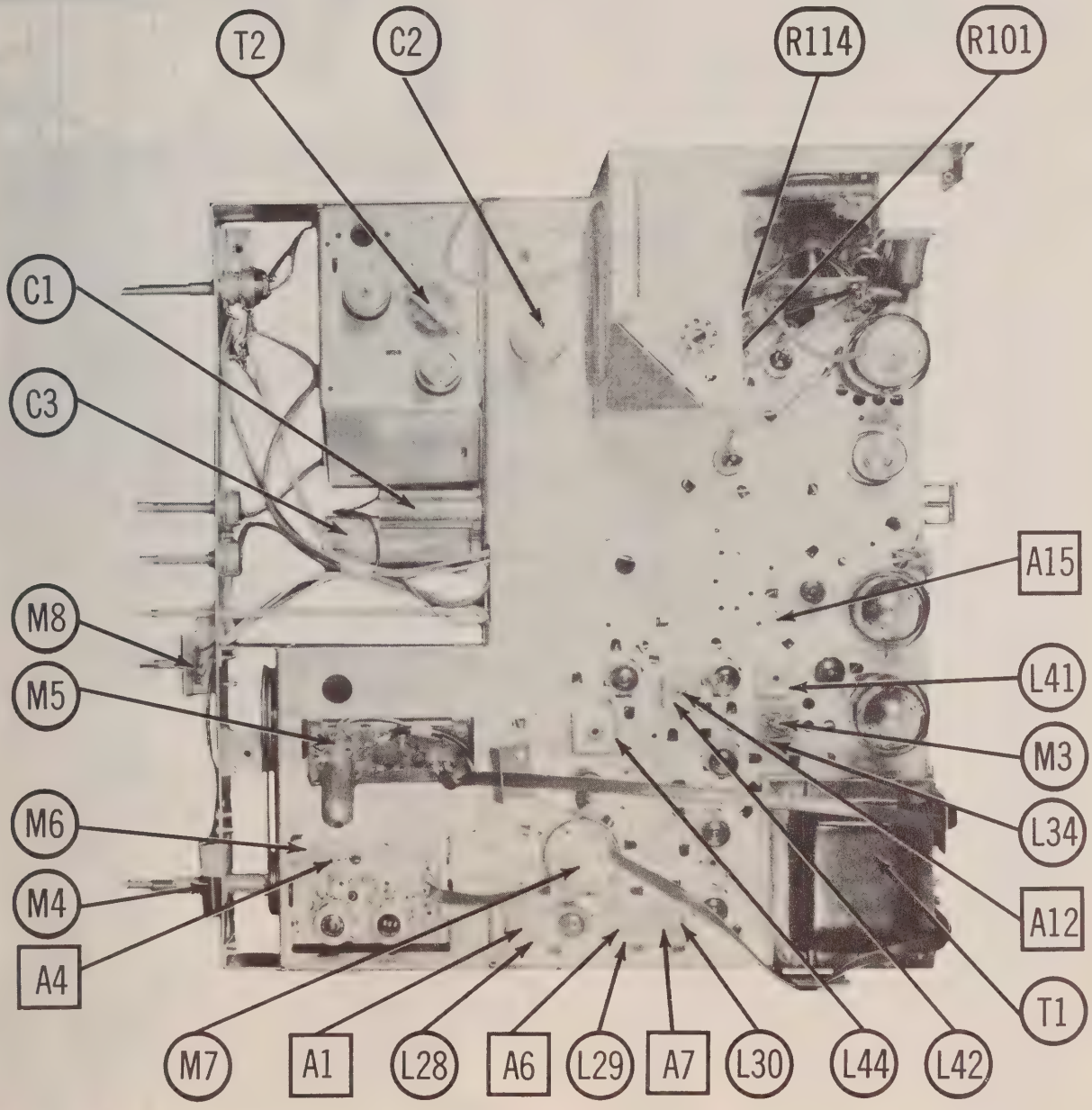

CHASSIS TOP VIEW

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CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

ARVIN
MODEL 9245CW-UHF (Ch. TE373-UHF)

TUBE PLACEMENT CHART

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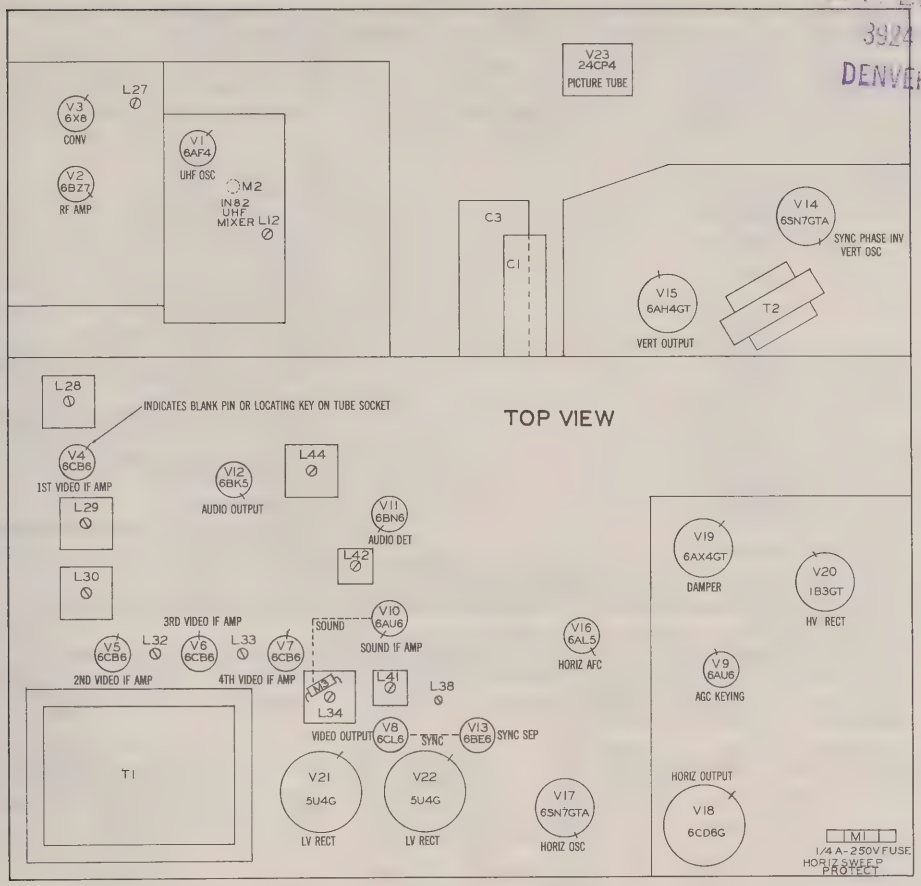

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V21, V22

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7 (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V8, V23
Has pic, no sound - V10, V11, V12
Overloaded picture - V9

SYNC FAILURE
No vert. sync - V14
No horiz. sync - V14, V16, V17
No vert. or horiz. sync - V13, V14

SWEEP FAILURE
No raster, has sound - V17, V18, V19, V20, V23, Fuse (M1)
No vertical deflection - V14, V15
Poor vert. linearity or foldover - V14, V15
Poor horiz. linearity or foldover - V17, V18, V19
Narrow picture - V17, V18, V19, V20, V21, V22
Vert. off freq. - V14
Horiz. off freq. - V14, V16, V17

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS--READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V17) to disable the high voltage.

VIDEO IF ALIGNMENT

Set the "Local-Suburban-Distance" switch to "Suburban" position. Remove the AGC keyer tube (6AU6), V9 from its socket. Connect the negative lead of a 2.5 volt bias supply to the ungrounded side of C65. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube. Low side to chassis.	39.75MC (Unmod)	9, 10 or 11	DC probe thru 18KΩ to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	41.25MC	"	"	A2	"
3.	"	"	47.25MC	"	"	A3	"
4.	"	"	43.2MC	"	"	A4	Detune A5 fully counter clockwise. Adjust A4 for maximum deflection.
5.	"	"	45.2MC	"	"	A5	Adjust for maximum deflection.
6.	"	"	44.0MC	"	"	A6	Adjust for maximum deflection. If two peaks occur, use the outer peak.
7.	"	"	42.2MC	"	"	A7	Adjust for maximum deflection. If two peaks occur, use the outer peak. Repeat steps 6 and 7.
8.	"	"	40.3MC	"	"	A8	Adjust for maximum deflection.
9.	"	"	45.2MC	"	"	A9	"
10.	"	"	43.0MC	"	"	A10	Adjust for maximum deflection. Repeat steps 8, 9 and 10.

OVERALL VIDEO IF RESPONSE CHECK

Increase the bias to 3.5 volts at the ungrounded side of C65. Replace converter tube shield to its normal position.
Connect the high side of an RF signal generator to chassis near V4. Leave the low side disconnected. This generator is to be used to provide markers on the response curve.
Connect a 300MMF capacitor across the input terminals of the vertical amplifier of the oscilloscope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	41.25MC 42.25MC 45.0MC 45.75MC	10	Vert. Amp. thru 18KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. A9 positions the 45.75MC marker and A10 affects tilt. SLIGHT adjustment of A4 and A5 may be necessary to obtain desired response.

SOUND IF ALIGNMENT

Replace V9 in its socket.
Tune in a TV station and reduce signal into set until hiss is heard with sound. The signal input may be reduce by inserting an attenuator pad between the antenna lead-in and the antenna terminals. If an attenuator pad is not available, disconnect the antenna lead-in and stray feed the signal by placing the lead in near the set. Set the buzz control (R5) to its mid-range position and Adjust A11, A12, A13 and A14 for clearest sound and minimum buzz. If the hiss should disappear during adjustment reduce the signal input to place the signal below the limiting level of the 6BN6 limiter detector.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL AND VTVM

Turn the set on and tune in a TV station.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	Not used	Not used	Not used	Tune in any local station	DC probe thru detector (Fig.2) to pin 2 (grid) of 6BN6 (V11). Common to chassis.	A11, A12, A13	Adjust for maximum deflection. Remove VTVM and detector probe. Set R5 to its mid-range position and adjust A14 for maximum sound. Readjust R5 for MINIMUM buzz.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13	.01MFD	High side to pin 9 (grid) of 6CL6 (V8). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru detector (Fig.2) to the junction of L38 and L39. Common to chassis.	A15	Adjust for MINIMUM deflection.

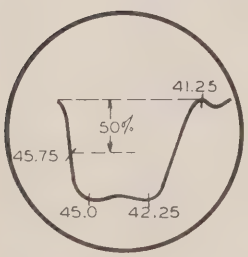

FIG.1

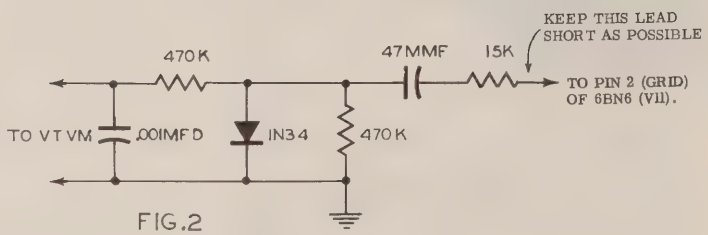

FIG.2

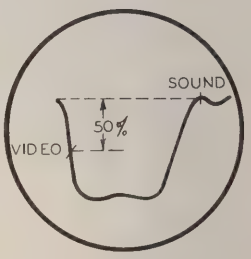

FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

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OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Connect the negative lead of a 3.5 volt bias supply to the ungrounded side of C65. Connect the positive lead to chassis. Remove V9 from its socket.

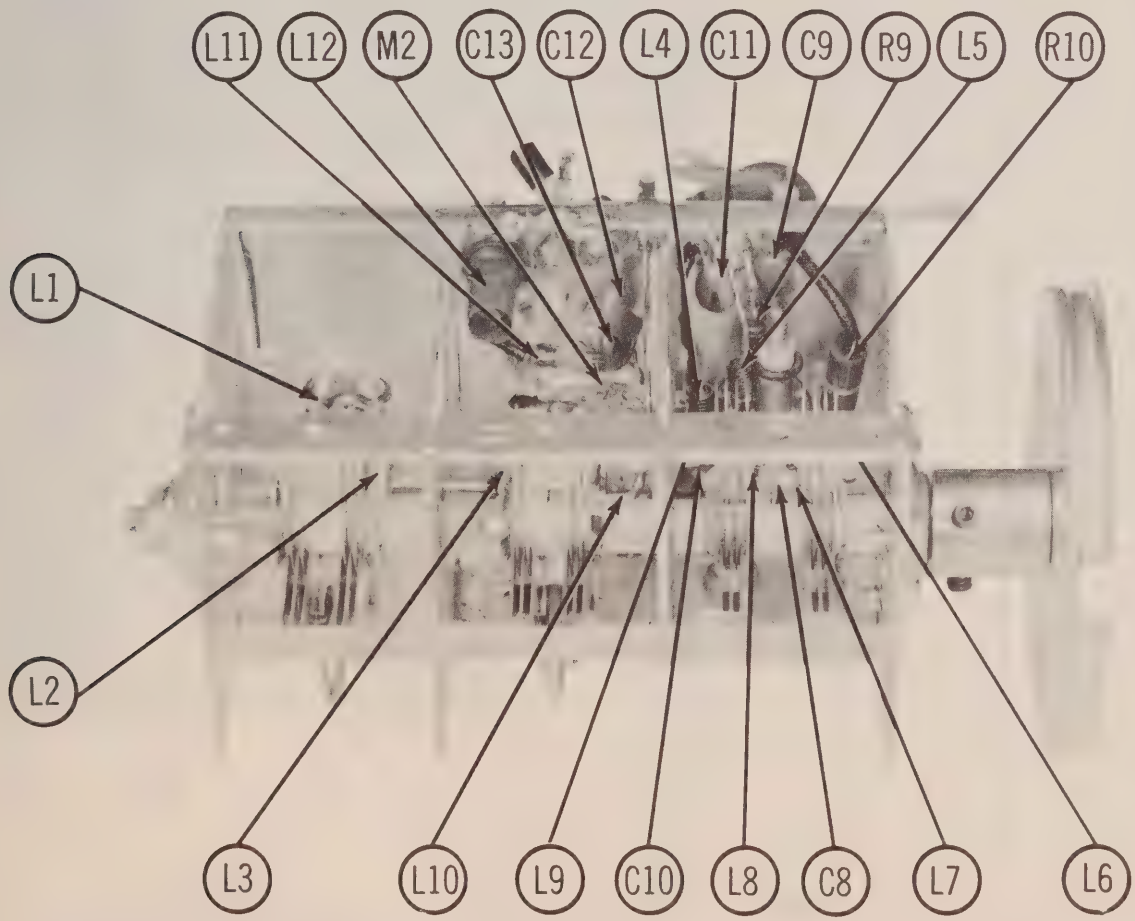
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 18KΩ to point (A). Low side to chassis.	A16	Adjust to place sound marker in trap on low frequency side of response curve as in Fig. 3. Video marker should be at 50%.
15.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for sound and video marker placement as in Fig. 3. If necessary make compromise adjustment of A16 for any individual channel, then recheck all other high band channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
16.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A17	Adjust to place sound marker in trap notch on low frequency side of response curve as in Fig. 3. Video marker should be at 50%.
17.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	"	Check for sound and video marker placement as in Fig. 3. If necessary, make compromise adjustment of A17 for any individual channel, then recheck all other low band channels to see that they have not been seriously affected. Remove bias battery and replace V9 in its socket.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

RF AND MIXER ALIGNMENT

The RF and mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF TUNER ALIGNMENT

Alignment of this portion of the receiver is not recommended in the field. Should the UHF tuner require major repair or alignment the entire UHF tuner unit should be returned to the factory.

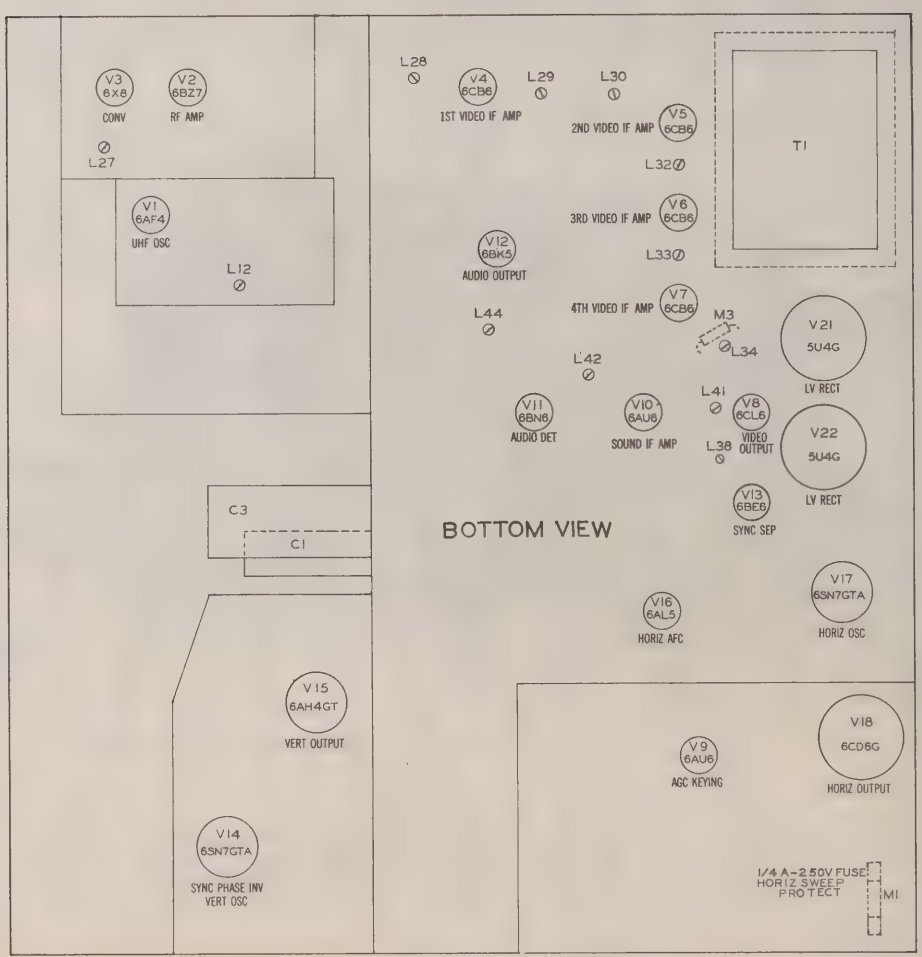


UHF TUNER

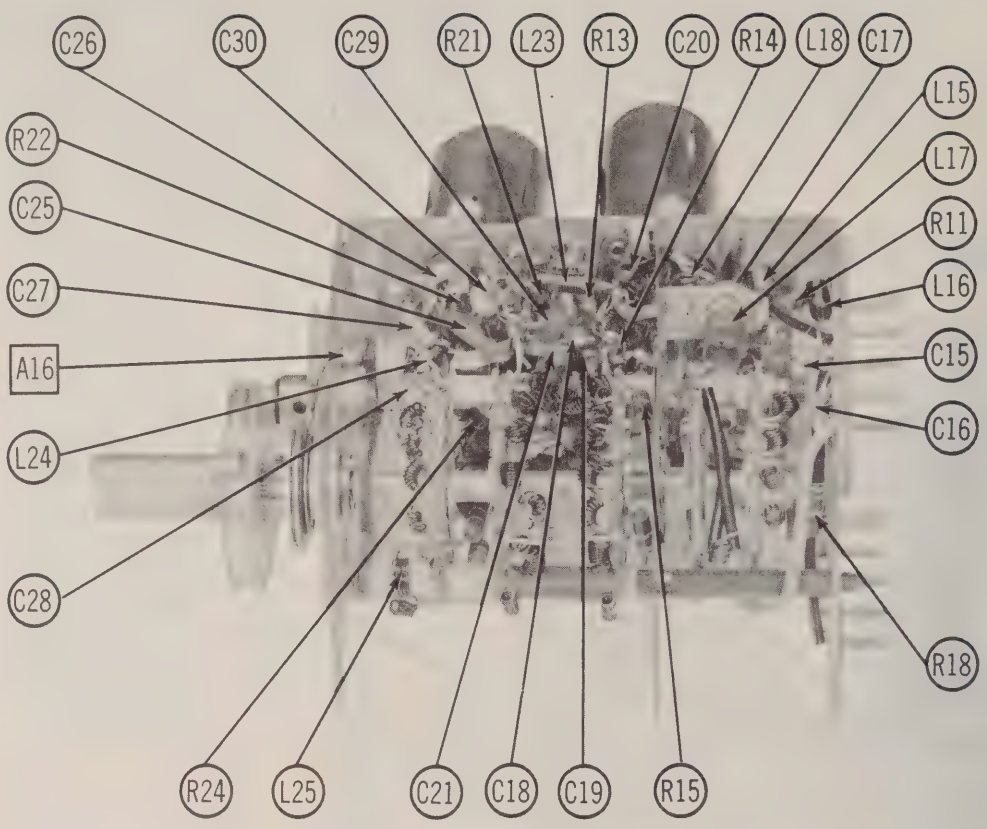
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	■†8.2KΩ	15KΩ	.1Ω	0Ω	0Ω	15KΩ	■†8.2KΩ		
V 2	6BZ7	†3.8KΩ	435KΩ	INF	.1Ω	0Ω	INF	185KΩ	0Ω	0Ω
V 3	6X8	0Ω	15KΩ	†10.7KΩ	0Ω	.1Ω	220Ω	220KΩ	†8.2KΩ	†7.1KΩ
V 4	6CB6	92KΩ	47Ω	0Ω	.1Ω	†3.7KΩ	†2.7KΩ	0Ω		
V 5	6CB6	87KΩ	47Ω	0Ω	.1Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 6	6CB6	87KΩ	47Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 7	6CB6	.3Ω	180Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 8	6CL6	0Ω	3.9KΩ	†15K Ω	0Ω	.1Ω	†7.2KΩ	0Ω	†15KΩ	3.9KΩ
V 9	6AU6	†21KΩ	†2.6KΩ	0Ω	.1Ω	260KΩ	†12KΩ	†2.6KΩ		
V 10	6AU6	5.5Ω	0Ω	0Ω	.1Ω	†2.7KΩ	†2.7KΩ	68Ω		
V 11	6BN6	400Ω	3.1Ω	0Ω	.1Ω	†8.5KΩ	4.6Ω	†380KΩ		
V 12	6BK5	†2.5KΩ	INF	500KΩ	0Ω	.1Ω	180Ω	500KΩ	†2KΩ	INF
V 13	6BE6	50KΩ	0Ω	.1Ω	0Ω	37KΩ	†40KΩ	1.5Meg		
V 14	6SN7GT	1.6Meg	▲2.8Meg	0Ω	37KΩ	†3.6KΩ	5.8KΩ	.1Ω	0Ω	
V 15	6AH4GT	2.2Meg	0Ω	INF	INF	†1.4KΩ	INF	.1Ω	930Ω	
V 16	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	22KΩ	0Ω	22KΩ		
V 17	6SN7GT	110KΩ	†120KΩ	1.2KΩ	5.7Meg	†8.3KΩ	1.2KΩ	0Ω	.1Ω	
V 18	6CD6G	INF	0Ω	300Ω	INF	470KΩ	†9KΩ	.1Ω	†9KΩ	TOP CAP ▲12Ω
V 19	6AX4GT	INF	INF	INF	INF	†62Ω	INF	.1Ω	0Ω	
V 20	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲408Ω
V 21	5U4G	†0Ω	15KΩ	†43Ω	10.5Ω	INF	10.5Ω	INF	15KΩ	
V 22	5U4G	INF	15KΩ	INF	11Ω	INF	11Ω	INF	15KΩ	
V 23	24CP4	0Ω	12KΩ	PIN 10 ▲1Meg	PIN 11 †140KΩ	PIN 12 .1Ω				

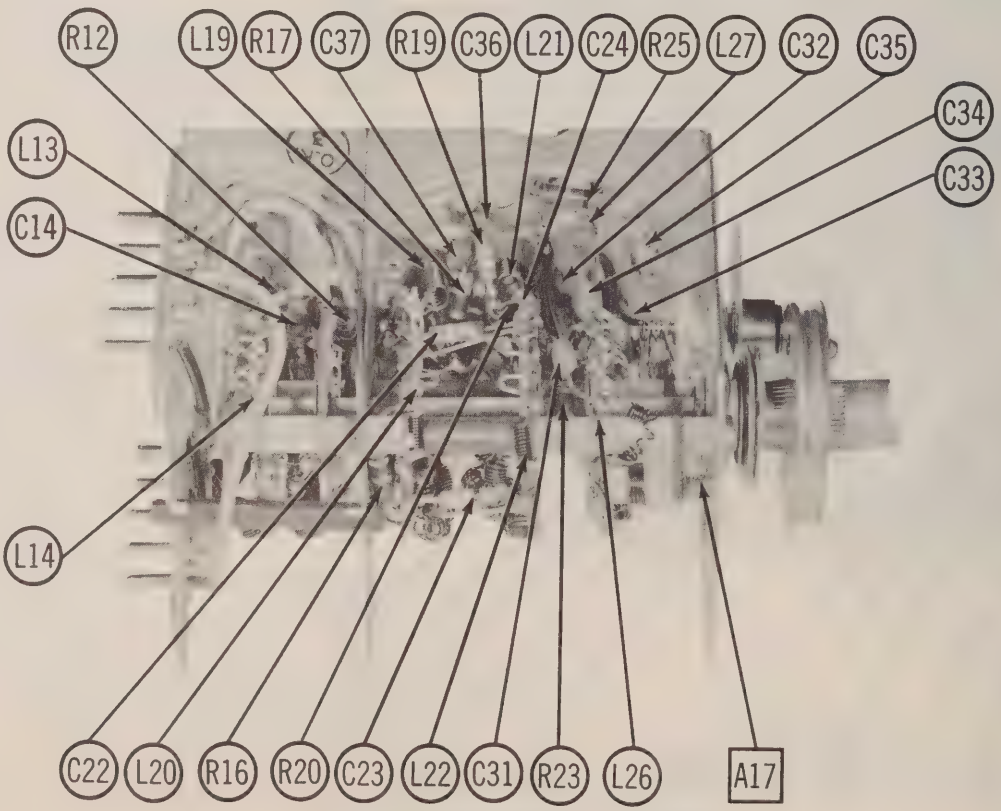
■ MEASURED IN UHF POSITION
† MEASURED FROM PIN 2 OF V22
▲ MEASURED FROM PIN 3 OF V19



TUBE PLACEMENT CHART



VHF TUNER-RIGHT SIDE



VHF TUNER-LEFT SIDE

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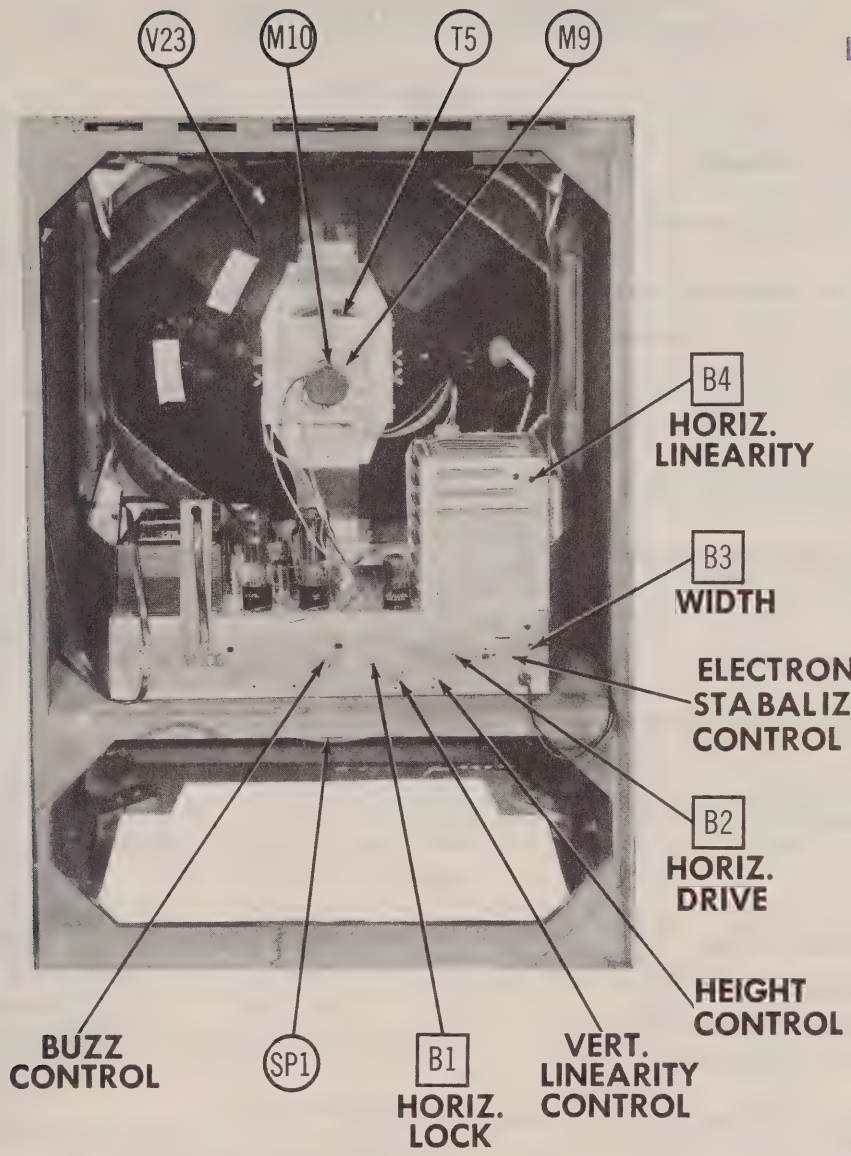


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control fully counter clockwise.

Adjust the horizontal lacks slug (B1) until 3 or 4 diagonal bars appear on screen.

Turn horizontal hold control clockwise until picture syncs. Momentairly switch off channel and back again. If picture does not fall in sync, slightly retouch B1.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V17, V18, V19, V21 and V22. Check B2, B3 and B4. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, C99, C98, R114 and other associated components.	Check C95, C94, C6, R106, R107, R109 and other associated components.

DRIVE LINES

Check by substitution V17, V18 and V19. Check B2 and B4. Check T3, T5A, R112, R111, R110, C6 and other associated components.

COMPRESSED LEFT SIDE

Check adjustments of B2, B3 and B4. Check by substitution V18 and V19. Check components associated with the horizontal output and damper stages especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check V17, V18 and V19 for internal arcing. Check C90 for open. Check T3 and T5A for internal arcing between windings.

XMAS TREE EFFECT

Check by substitution V17, V18 and V19. Check L45, C93, C94, C96 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V14 and V15. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B, C84 and other associated components.	Check C83, C81, R7, R88, R91, T2 and other associated components.

INSUFFICIENT SWEEP

Check adjustments of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V14 and V15. Check T4, T5B, R88, R7 and other associated components.

COMPRESSED AT TOP

Check by substitution V14 and V15. Check C2D, R6, R92, R90, R89, and other associated components.

FOLDS

Check by substitution V14 and V15. Check associated components, especially T4 and T5B for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V13 and V14. Check C76, R8, R75, R74, R65, R77, R79 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V13 and V14. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check T2, C80, R87, R2 and other associated components.	Check vertical integrator and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitutiton V16 and V17. Check waveform W15.

If Satisfactory	If Unsatisfactory
Check L45, C92, R102, R104, R3, C93 and other associated components.	Check components associated with V16 and V17 especially C85, C87 and C88.

HORIZONTAL BENDING

Check by substitution V13, V14A, V16 and V17. Check horizontal AFC filter network for component failure or change of value.

VIDEO

LOSS OF VIDEO

Substitute V8. Check components associated with V8 and picture tube.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best picture and sound. Check A15. Check video IF alignment.

POOR CONTRAST

Substitute V8. Check video detector crystal and assembly. Check picture tube and other associated components.

NEGATIVE PICTURE

Substitute V8. Check AGC network. Check picture tube abd other associated components.

SMEAR

Substitute V8. Check L35, L36, L37, L38, L39, L40, R47 and R48. Check AGC network. Check picture tube and other associated circuit components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V10, V11 and V12. Check stage V12 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check L42, L44, R67, R69, R70, R71, R68, C71 and C66. Check audio IF alignment and other associated components.	Check C75, C3D, R73, T8, speaker and other associated circuit components.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust R5 for minimum buzz. If unsatisfactory adjust A14. Substitute V11 and realign audio IF and detector stages. Check L43 and C68.

DISTORTED

Follow procedure outlined under "Weak or No Sound":

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	UHF Oscillator	6AF4	6AF4	6DK	
V2	VHF RF Amp.	6BZ7	6BZ7	9AJ	
V3	VHF Converter	6X8	6X8	9AK	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	4th. Video IF Amp.	6CB6	6CB6	7CM	
V8	Video Output	6CL6	6CL6	6CL6	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Audio Detector	6BN6	6BN6	7DF	
V12	Audio Output	6BK5	6BK5	9BQ	
V13	Sync Separator	6BE6	6BE6	7CH	
V14	Sync Phase Inv.-Vert. Oscillator	6SN7GTA	6SN7GTA	8BD	
V15	Vert. Output	6AH4GT	6AH4GT	8EL	
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V18	Horiz. Output	6CD6G	6CD6G	5BT	
V19	Damper	6AX4GT	6AX4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5U4G	5U4G	5T	
V22	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ARVIN PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V23	24CP4	24CP4A 24TP4	24CP4A	24CP4 24CP4A		12N 12N 12N	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	30	400	22422-22	AFH1-51		A047		FP145	TVL-1720	
C2A	▲30	400	22422-20	AFH4-123				FP447	R1457	
B	■60	350		PRS450/20				TC3501		
C	▲20	350								
D	100	50								
C3A	▲50	400	22422-21	AFH4-103				FP431.4	TVL-4707	
B	■60	350						TC78	TVA-1712	
C	▲40	350								
D	20	25								
C4	10	350	41429	PRS350/10		BR1235		TC62	TVA-1604	
C5	5	250	40002	PRS250/4		BR425		TC50X	TVA-1501	
C6	4	150	25453	PRS150/4		BR415		TC40	TVA-1402	
C7	2	150	41534	PRS150/4		BR245		TC40	TVA-1402	
C8	1.5						N330K-1R5			
C9	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C10	.5									
C11	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C12	33			SI33NP0	TCZ-33	Z029	NP0K-330	ZT-5433	5TCC-Q33	
C13	82									
C14	22			SI22	D6-220	TP22	GP1K-220	UC-5422	5GA-Q22	
C15	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C16	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C17	3.9									
C18	470			BPD-00047	D6-471	K060	801-471	UC-5347	5GA-T47	
C19	1000			EF-001	MFT-1000				503C-D1	
C20	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C21	.33									
C22	.39									
C23	2									
C24	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C25	.75									
C26	1.5						N330K-1R5			
C27	10			SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C28	1.5			SI1.5NP0	TCZ-1.5	TZ04	NP0K-1R5	ZT-5515	5TCCB-V15	
C29	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C30	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C31	1.6									
C32	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C33	10			SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C34	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C35	120									
C36	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C37	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C38	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	.1	400	25402-104	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C40	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C41	4700		40053-472	BPD-0047	DD-502	K079	811-0047	DC-525	5HK-D47	
C42	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C43	3.9		40355-16				NP0K-3R9			
C44	560		41052-1	SI560	D6-561	G063	GP2K-561	UC-5356	5GA-T56	
C45	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C46	2.7		41077-1							
C47	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C48	560		41052-1	SI560	D6-561	G063	GP2K-561	UC-5356	5GA-T56	
C49	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C50	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C51	560		41052-1	SI560	D6-561	G063	GP2K-561	UC-5356	5GA-T56	
C52	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C53	560		41052-1	SI560	D6-561	G063	GP2K-561	UC-5356	5GA-T56	
C54	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C55	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C56	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C57	1000		23076	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C58	47			SM7NP0	TCZ-47	Z033	NP0K-470	Z7-5447	5TCC-Q47	
C59	39	500	20290-390	1469-00004	TCZ-39	22R5Q39	NP0K-390	MCB233	MS-44	
C60	.1	200	25455-104	P388-1	DF-104	CUB2P1		PT401	2TM-P1	
C61	.047	400	25455-473	P488-047	DF-503	CUB4S47		PT7447	4TM-S47	
C62	1000		23078	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C63	1000	1000	40108-102	HVD15-001		VD1	1R5KV-102	MCK210	10GA-D1	
C64	4700		40054-472	BPD-0047	DD-502	K079	811-0047	DC-525	5HK-D47	
C65	.22	200	25462-224	P388-22		CUB2P22		PT4022	2TM-P22	
C66	10000		40053-103	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C67	10000		40053-103	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C68	10000		40053-103	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C69	10000		40053-103	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C70	4700		40054-472	BPD-0047	DD-502	K079	811-0047	DC-525	5HK-D47	
C71	.22	400	25462-234	P488-22		CUB4P22		PT4022	4TM-P22	
C72	10000		40053-103	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C73	750		40054-751	SI750	D6-751	G086	GP2K-751	UC-5375	5GA-T75	
C74	4700		40054-472	BPD-0047	DD-502	K079	811-0047	DC-525	5HK-D47	
C75	3900	1000	41837-1							
C76	.01	200	25455-103	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C77	.1	200	25455-104	P388-1	DF-104	CUB2P1		PT401	2TM-P1	
C78	.47	200	25455-474	P288-47		CUB2P47		PT4047	2TM-P47	
C79A	.002		⌀24166	⌀PA-130	⌀PC-100	⌀115TM1	⌀1405-01	PT622	⌀V-1	
B	.005							PT625		
C	.005							PT625		
C80	4700	500	20324-472	1464-005		IR5D47		MCE465	MS-25	
C81	.05	600	25461-473	P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C82	.022	200	25455-223	P488-022	DF-203	CUB4S22	817-03	PT4122	4TM-S22	
C83	.1	600	25461-104	P688-1	DF-104	CUB4P1		PT601	6TM-P1	
C84	.047	200	25455-473	P288-047	DF-503	CUB2S47		PT7447	2TM-S47	
C85	.1	600	25461-104	P688-1	DF-104	CUB4P1		PT601	6TM-P1	
C86	1000		40054-102	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C87	1000		40054-102	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C88	.01	200	25455-103	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C89	4700		40054-472	BPD-0047	DD-502	K079	811-0047	DC-525	5HK-D47	
C90	.047	200	25455-473	P288-047	DF-503	CUB2S47		PT7447	2TM-S47	
C91	3900	500	20433-392	1464-004		IR5D39		MCE463	MS-24	
C92	100	500	20290-101	1469-00001		22R1T1		MCB235	MS-21	
C93	330	500	20331-331	1469-00035		5R5T33				
C94	330	500	20290-331	1469-00035		5R5T33				
C95	270	500	20290-271	1469-0003		5R5T27		MCB241	MS-33	
C96	.22	400	25462-224	P488-22		CUB4P22		PT4022	4TM-P22	
C97	240	5000								
C98	.047	600	20457-473	P688-047		CUB6S47		PT6147	6TM-S47	
C99	.047	600	20457-473	P688-047		CUB6S47		PT6147	6TM-S47	
C100	.22	400	25462-224	P488-22		CUB4P22		PT4022	4TM-P22	
C101	.22	600	25461-224	684-25		CUB6P22		PT6022	6TM-P22	
C102	.22	600	25461-224	684-25		CUB6P22		PT6022	6TM-P22	
C103	100	3000		HVD30-0001			3KV-101		30GA-T1	
C104	.1	400	25462-104	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C105	10000	1500	41135-103	P1688-01	DD16-103	CUB16S1		PT16I1	10HK-S1	
C106	10000	1500	41135-103	P1688-01	DD16-103	CUB16S1		PT16I1	10HK-S1	

⌀ Items C79A, C79B, C79C, R85A, R85B, R85C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	100K	½	E22464-50	* Q7-507	RTV-442		UF15L	Brightness-Panel
B	1 Meg	½					UR16-T25 †	Volume tapped ① 154KΩ-Rear
C	Switch						U3S-38	Attach to R1B
R2A	2 Meg	½	E22464-58	Q11-139	A47-2 Meg-S	AB-75	U-56	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	40KΩ	½	E22464-53	Q11-123	A47-40K-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4	15KΩ	½	E22464-52	Q17-118XX				Contrast tapped at 6KΩ &11K Ω
R5	500Ω	1	A41036		39-500			Buzz wire wound
R6A	3000Ω	½	E22464-41	Q11-112	A47-3000-S	AB-8	U-8	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	2.5Meg	½	E22464-43	Q11-239	A47-2.5MegS	AB-83	SU-565	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	7.5 Meg	½	E22464-57	Q11-142	A47-7.5Meg-S	AB-89	U-82	Electronic stabilizer
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A

* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B11-128 & P1-104 (Panel) B13-127X & RI-220 (Rear) & SWITCH 76-L.

† Universal replacement (Mallory exact duplicate Part No. U512358).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	ARVIN PART No.	IRC PART No.	NOTES
R9	15KΩ	1		BTS-15K	
R10	2200Ω	1		BTA-2200	
R11	15KΩ	1		BTS-15K	
R12	100KΩ	1		BTS-100K	
R13	1 Meg 5%	1		BTS-1 Meg 5%	
R14	750KΩ 5%	1		BTS-750K 5%	
R15	1000Ω	1		BTS-1000	
R16	3900Ω	1		BTS-3900	
R17	470Ω	1		BTS-470	
R18	3300Ω	1		BTS-3300	
R19	220KΩ	1		BTS-220K	
R20	2200Ω	1		BTS-2200	
R21	1000Ω	1		BTS-1000	
R22	15KΩ	1		BTS-15K	
R23	4700Ω	1		BTS-4700	
R24	220Ω	1		BTS-220	
R25	1000Ω	1		BTS-1000	
R26	1000Ω	1		BTA-1000	
R27	18KΩ	2		BTB-18K	
R28	15KΩ	2		BTB-15K	
R29	15KΩ	2		BTB-15K	
R30	15KΩ	2		BTB-15K	

ITEM No.	RATING OHMS	RATING WATT	ARVIN PART No.	IRC PART No.	NOTES
R31	1000Ω	½	23061-102	BTS-1000	
R32	4700Ω	½	23381-472	BTS-4700	
R33	8200Ω 5%	½		BTS-8200 5%	
R34	470 5%	½	23382-470	BTS-47 5%	
R35	1000Ω	½	23061-102	BTS-1000	
R36	1000Ω	½	23061-102	BTS-1000	
R37	1 000Ω	½	23061-102	BTS-1000	
R38	1000Ω	½	23061-102	BTS-1000	
R39	47Ω 5%	½	23382-470	BTS-47 5%	
R40	1000Ω	½	23061-102	BTS-1000	
R41	68000Ω 5%	½	23382-683	BTS-6800 5%	
R42	47Ω 5%	½	23382-470	BTS-47 5%	
R43	1000Ω	½	23061-102	BTS-1000	
R44	18KΩ	½	20302-183	BTS-18K	
R45	180Ω	½	23381-181	BTS-180	
R46	1000Ω	½	23061-102	BTS-1000	
R47	1200Ω 5%	½	23382-122	BTS-1200 5%	
R48	27000Ω 5%	½	23382-272	BTS-2700 5%	
R49	6000Ω	4	41075-602		
R50	2200Ω	2	23381-222	BTS-2200	
R51	15KΩ	2	23381-153	BTS-15K	
R52	100KΩ	2	23381-104	BTS-100K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	ARVIN PART No.	IRC PART No.	NOTES
R53	150KΩ	½	23381-154	BTS-150K	
R54	12KΩ	½	23381-123	BTS-12K	
R55	12KΩ 5%	½	23382-123	BTS-12K 5%	
R56	56KΩ 5%	½	23382-563	BTS-56K 5%	
R57	22KΩ 5%	½	23382-223	BTS-22K 5%	
R58	47KΩ 5%	½	23382-473	BTS-47K 5%	
R59	39KΩ 5%	½	23382-393	BTS-39K 5%	
R60	27KΩ 5%	½	23382-273	BTS-27K 5%	
R61	220KΩ 5%	½	23382-224	BTS-220K 5%	
R62	12KΩ	½	23381-123	BTS-12K	
R63	82KΩ	½	23382-823	BTS-82K	
R64	47KΩ	½	23381-473	BTS-47K	
R65	10KΩ	½	23381-103	BTS-10K	
R66	68Ω	½	23381-680	BTS-68	
R67	1000Ω	½	23381-102	BTS-1000	
R68	6800Ω	1	20070-682	BTA-6800	
R69	680Ω 5%	½	23382-681	BTS-680 5%	
R70	330KΩ	½	23381-334	BTS-330K	
R71	47KΩ	½	20061-473	BTS-47K	
R72	82KΩ	½	23382-823	BTS-82K	
R73	180Ω	½	20070-181	BTA-180	
R74	1.5 Meg	½	23381-155	BTS-1.5 Meg	
R75	1 Meg	½	23381-105	BTS-1 Meg	
R76	47KΩ	½	23381-473	BTS-47K	
R77	39KΩ 5%	½	23382-393	BTS-39K 5%	
R78	150KΩ	½	23381-154	BTS-150K	
R79	390KΩ	½	23382-394	BTS-390K	
R80	47KΩ	½	23381-473	BTS-47K	
R81	1100Ω 5%	½	23382-112	BTS-1100 5%	
R82	4700Ω	½	23381-472	BTS-4700	
R83	8200Ω 5%	½	23382-821	BTS-8200 5%	
R84	12000Ω 5%	½	23382-122	BTS-1200 5%	
R85A	22KΩ	}	⌀ 24166	BTS-22K	
B	8200Ω	}		BTS-8200	
C	8200Ω	}		BTS-8200	
R86	470KΩ	½	23381-474	BTS-470K	
R87	1.3 Meg	½	23382-135	BTS-1.3 Meg	
R88	1 Meg	½	23381-105	BTS-1 Meg	Note i
R89	9100Ω 5%	½		BTS-9100 5%	

⌀ Items R85A, R85B, R85C, C79A, C79B, C79C are combined in one unit.
Note 1. Some models may use a 470KΩ resistor in this application.
Note 2. Some models may use a 220Ω resistor in this application.
Note 3. Some models may use a 18KΩ resistor in this application.
Note 4. Not used in all models.
Note 5. Some models may use a 470Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC ⑥2.58A	600VCT .250ADC	5VAC ⑥6A	E40926		P-3055				
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC ⑥10.8A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	ARVIN PART No	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T2	Vert. Osc. Trans.	41745-1	A-8125	A-3003	A-97X	209T1 ⑤	B6702	24A87 ⑤
T3	Horiz.Output Trans.	41803			D-50 *	235T1 *		FLY-16 *
T4	Vert. Output Trans.	41092-1						
		41092-2 ②						
T5A	Yoke-Horiz.(L.5MH)	40537		MDF-90③	Y-50-1④	219D1 ③		Y-14
B	Vert.(41MH)							
T6	Horiz.Linearity(1.26-11MH)	40533	WC-8⑤	MWC-6	WC-12⑤⑥	213R1 ⑤		
T7	Width (3.5-28MH) (3-18MH)	40632	WC-5 ⑦	MWC-1⑦	WC-11⑦	214R1⑤⑦	RF800⑦	WC-20⑦

① Drill one new mounting hole.
② Alternate vertical output transformer.
③ Use original yoke network and leads.
④ Use original yoke network if necessary.
⑤ Drill new mounting hole.
⑥ Connect to coded blue and red terminals.
⑦ Connect primary to terminals #3 and 1, Secondary to AFC.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
	9			9	9		9
	7			7	7		7
	6			5	5		5
	T			T	T		T
	3			3	3		3
	1			1	1		1
Connect Width Coil Across	3 & 1			3 & 1			3 & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	IMPEDANCE SEC.	ARVIN PART No	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordarson PART No	NOTES
T8	5.4KΩ	3.3Ω	C24776-2	A-3877 ⊥	A-3019	S-5X	Z1002	26849	⊥ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	ARVIN PART No.	JENSEN PART No.	QUAM PART No	NOTES
SP1	6 X 9	PM	3.3Ω	D-23837	ST-610 Mod. P69-V	49A2	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI	DC RES. SEC	ARVIN PART No.	MEISSNER PART No	MERIT PART No.	MILLER PART No	NOTES
L1	UHF Antenna Coil Primary	0Ω						
L2	UHF Antenna Coil Secondary	0Ω (tapped)						
L3	UHF RF Coil	0Ω (tapped)						
L4	Fil. Choke	0Ω						
L5	Fil. Choke	0Ω						
L6	RF Choke	0Ω						
L7	UHF Osc. Coil	0Ω						
L8	UHF Osc. Coil	0Ω						
L9	UHF Osc. Coupling	0Ω						
L10	UHF Mixer Coil	0Ω (tapped)						
L11	RF Choke	1.6Ω						
L12	UHF IF Output Coil	1.0ΩCT						
L13	VHF Ant. Trans.	0ΩCT	0ΩCT				1 3/4A-300	Note 2
L14	VHF Ant. Coil	0Ω					1 3/4A-600	
L15	VHF Ant. Coil	0Ω					BTB-27K	Note 3
L16	UHF IF Coil	0Ω					BTB-27K	Note 3
L17	UHF IF Coil	0Ω					BTB-27K	Note 4
L18	Neutr. Coil	0Ω						
L19	VHF RF Coil	0Ω						Channel 13
L20	VHF RF Coil	0Ω						
L21	VHF Mixer Grid Coil	0Ω						Channel 13
L22	VHF Mixer Grid Coils	0Ω						
L23	Fil. Choke	0Ω						
L24	VHF Osc. Plate Coil	0ΩCT						Channel 13
L25	VHF Osc. Coil	0Ω						Channel 6
L26	VHF Osc. Coil	0Ω						
L27	Conv. Plate	.1Ω						
L28	1st Video IF Grid	0Ω		41175	17-4531 *		6216 *	Includes trap, 5000MMF capacitor & 22KΩ resistor
L29	1st Video IF Plate	.1Ω		41171			6217	Includes trap 100MMF capacitor & 4700Ω resistor
L30	2nd Video IF Grid	.1Ω		41172			6218	Includes trap
L31	Fil. Choke	0Ω		23095	19-3001	TV-189	6175	6 Microhenry
L32	3rd Video IF	.3Ω	.3Ω	41173	19-1045		6219	
L33	4th Video IF	.3Ω	.3Ω	41173	17-4523		6219	
L34	5th Video IF	.2Ω	.2Ω	41174				Includes 1N64 crystal detector, 10KΩ resistor, 2-1000MMF capacitors, 10MMF capacitor, & 2-56 Microhenries RF chokes.
L35	Series Peaking Coil	4.2Ω		25468-18	19-3093 †	TV-181 †	6177 †	93 Microhenries; wound on 8.2KΩ resistor
L36	Shunt Peaking Coil	1.1Ω		25468-15	19-3500	TV-186	6174	500 Microhenries
L37	Series Peaking Coil	6.5Ω		25468-19	19-3180 *	TV-184 *	6180 *	185 Microhenries, wound on 8.2KΩ resistor
L38	4.5MC Trap	1.5Ω		25809	20-1004	TV-151	1470	
L39	Shunt Peaking Coil	1.1Ω		25468-16	19-3500 ■	TV-188 ■	6174 ■	500 Microhenries, wound on 10KΩ resistor
L40	Series Peaking Coil	5.5Ω		25468-20	19-4200	TV-185 ▲	6154 ▲	215 Microhenries, wound on 8.2KΩ resistor Tapped ▲ 4.4Ω
L41	1st Sound IF	5.5Ω		41176	17-1025			
L42	2nd Sound IF	5Ω	3.1Ω	41177 '	17-1021	TV-108 ▬	1466 ▬	1.85 Microhenry
L43	RF Choke	6Ω		25468-1	19-3180	TV-184	6180	
L44	Quadrature Coil	4.8Ω		40937		TV-113 #	1470-A #	
L45	Horiz. Osc.	60Ω		23449	19-1576	TV-163	6210	
L46	RF Choke	4Ω		25468-10	19-3093	TV-181	6177	93 Microhenries

* Use secondary & trap windings only; add .005MMF capacitor externally.
† Parallel with 6.8KΩ resistor
⌀ Parallel with 8.2KΩ resistor
■ Parallel with 10KΩ resistor
Use one winding only and use adaptor plate.
▲ Parallel with 8.2KΩ resistor
▬ Drill one new mounting hole.
⊥ Use adaptor plate.

ARVIN
MODEL 9245CM-UHF (Ch. TE373-UHF)

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L47	.230ADC	43.5Ω	2 Hy.	C-22561-5	C-2326①	C-2996①	C-17X ①	C5037 ①	26C44 ①

① Drill one new mounting hole.

FUSES

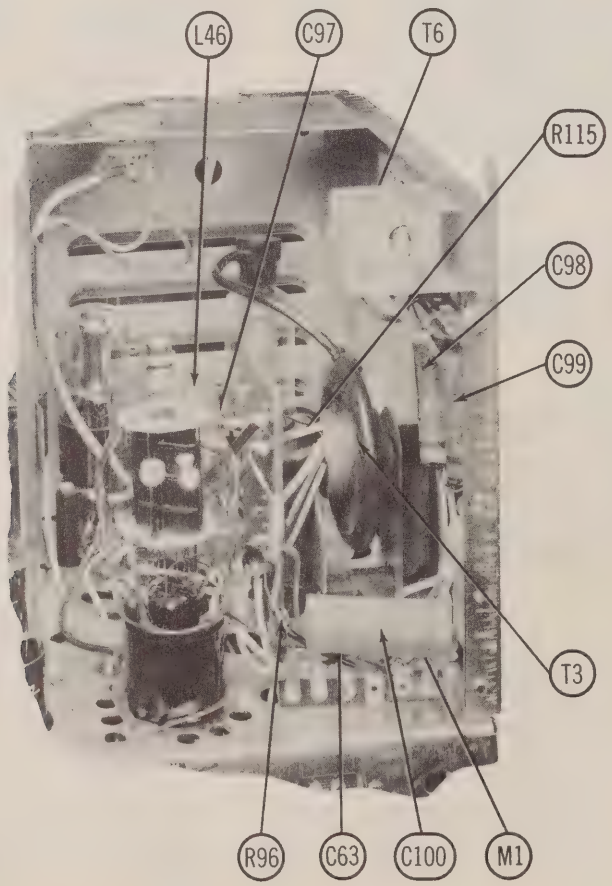
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ARVIN PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG P/T Slo/Blo	1/4A 250V	40663		315.250 (3AG P/T 1/4A-Slo/Blo)		MDV 1/4	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ARVIN PART No.	SYLVANIA PART No.	FEDERAL PART No.	
M2	1N82		1N82 or 1N82A		UHF Mixer
M3	1N64	23262	1N132, 1N60	1N64A	Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M4	Dial Light	19351	#47 Bayonet
M5	Tuner	41766-1	UHF
M6	Tuner	41737	VHF
M7	Trap	41464	41MC antenna filter
M8	Switch	41039	Local-distance (AGC)
M9	Focus Magnet	40991-2	Includes centering device
M10	Ion Trap	25662-2	
B2	Trimmer Cap.	24528	Horiz. Drive (40-370MMF)
	Disc	41713	UHF Indicator
	Knob	41760-1	Channel Selector
	Knob	41048-1	Volume
	Knob	40948	Fine tuning
	Knob	40932	Brightness
	Knob	24699-7	Behind Control Door
	Safety Glass	41331	



HIGH VOLTAGE COMPARTMENT

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check A C interlock assembly, switch on volume control and T1. If filaments light, substitute V21 and V22. Check B+ filter and decoupling network components.

SMALL AND/ OR DIM PICTURE

Substitute V21 and V22. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check M1 fuse. Check by substitution V17, V18, V19 and V20. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, C96, C99, C98, C97, R114, R112, R111, R110 and other associated components.	Check C95, C94, C93, R105, L45, and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V17, V18, V19, V21 and V22. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V18, V19, V20, V21 and V22. Check C103, R95, T3, T5A and other associated circuit components.

GENERAL

RASTER — SOUND — NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER — PICTURE - NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER - NO SOUND — NO PICTURE VHF

Check by substitution V2, V3, V4, V5, V6, V7 and V8. Check VHF-UHF switch for operation and other associated components.

RASTER — NO SOUND — NO PICTURE UHF

Check VHF-UHF switch for UHF operation. Check V1.

NO RASTER — SOUND — HIGH VOLTAGE

Check R96 for open. If open, sound and high voltage will be satisfactory . Video waveform will be present at pin 11 of V23.

NO RASTER — NO SOUND

Follow procedure outlined under "Dead Set".

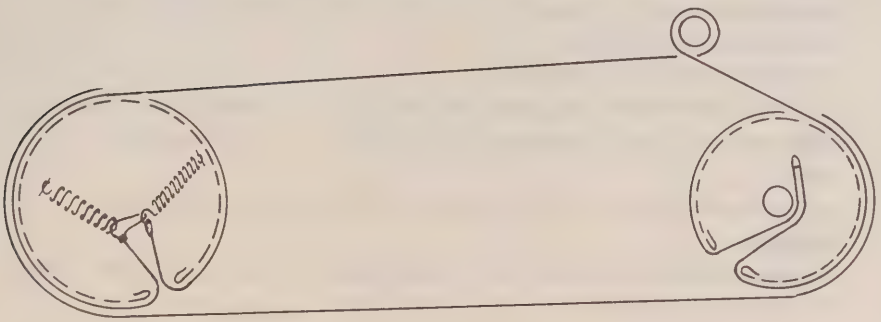
KEYSTONE EFFECT

Check T5, C103, R95, R93 and R94.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



UHF DRIVE CORD STRINGING

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

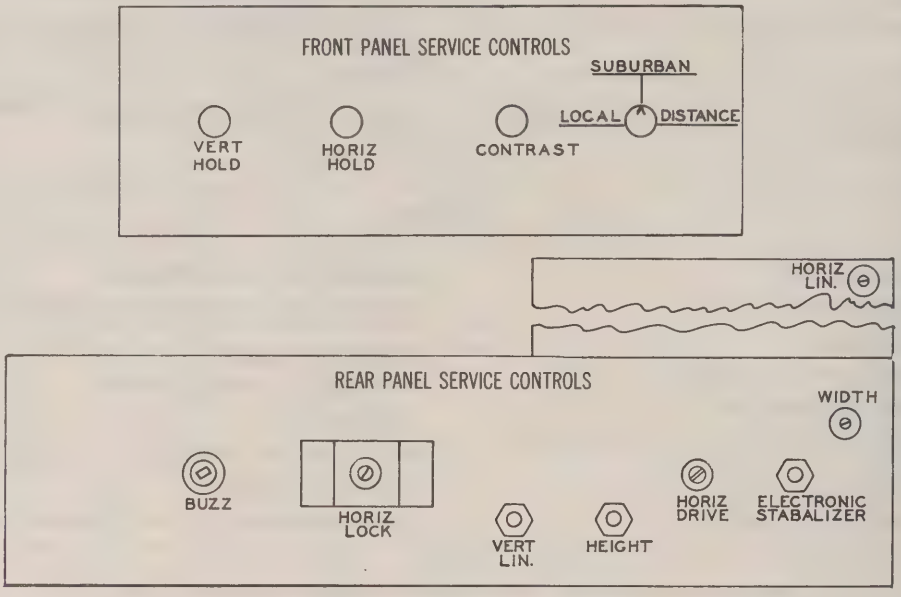
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove six wood screws holding metal strip at the top front of the cabinet. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - AUTOMATIC ELEC TRONIC STABILIZER CONTROL

If the picture becomes unstable due to electrical interference tune in the strongest station available and turn R8A clockwise until picture shifts or distorts. Turn R8A counter clockwise until picture becomes stable.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal lock slug (L45) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the buzz control located on rear apron of chassis for maximum volume and minimum buzz. If results are unsatisfactory see alignment instructions on pages 6 and 7.

FUSES

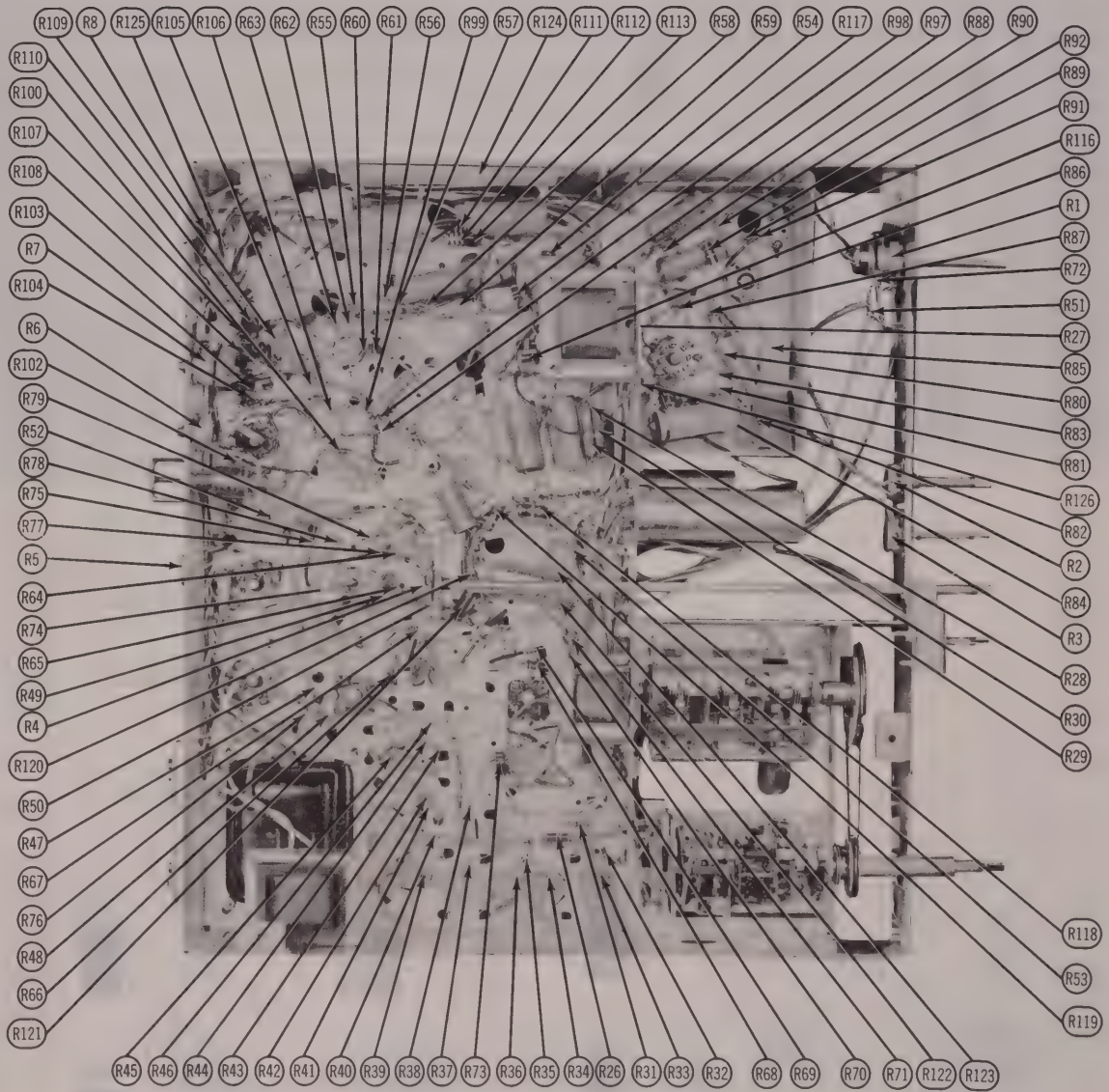
One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

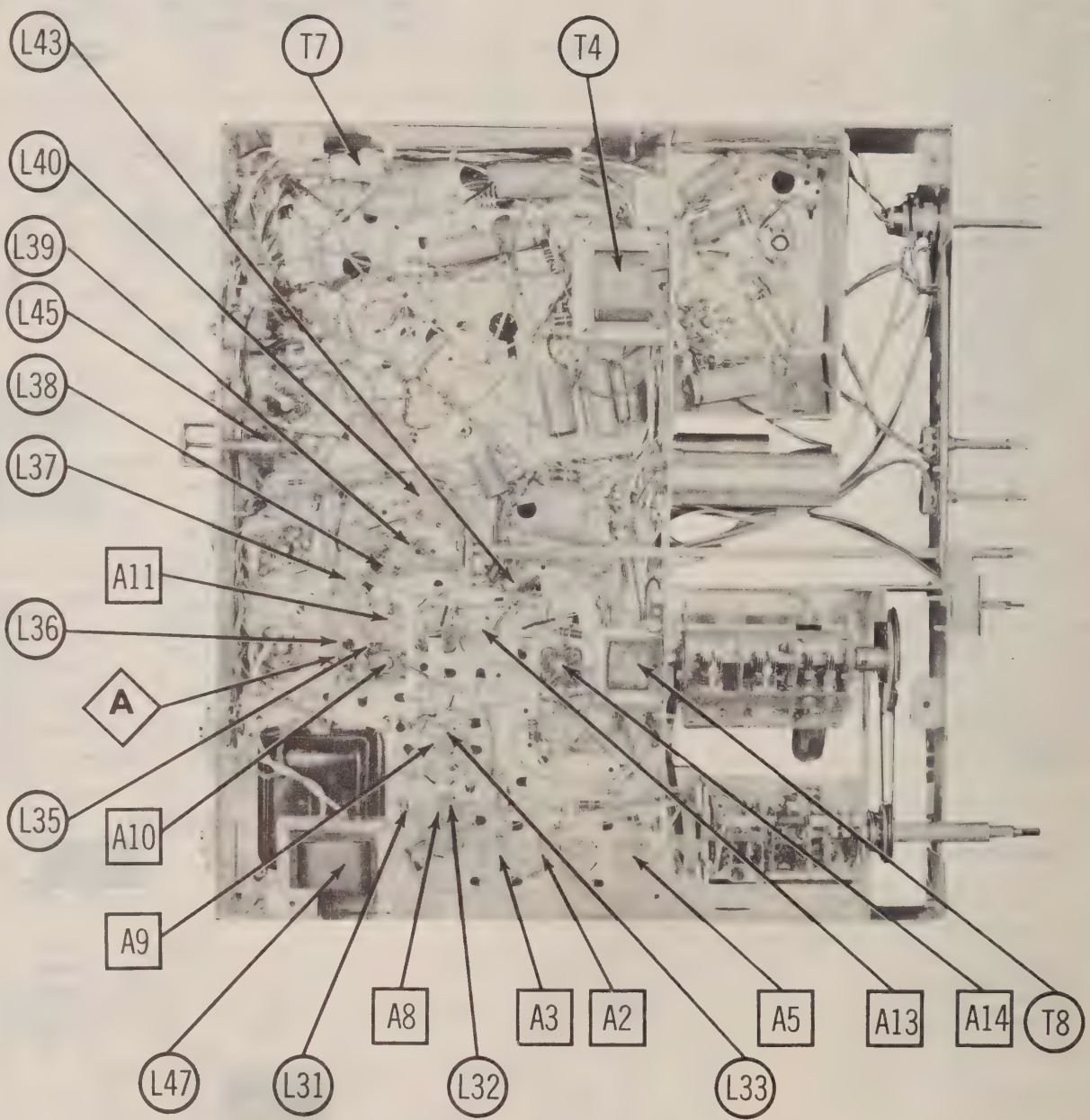
DISASSEMBLY INSTRUCTIONS

1. Remove 9 push-on type control knobs from front panel.
2. Disconnect built-in antenna.
3. Remove 6 wood screws and 1 metal screw. Remove rear cover.
4. Disconnect speaker plug, yoke plug, CRT socket and HV plug.
5. Remove 1 metal screw from ground strap to yoke.
6. Remove 6 chassis bolts. Remove chassis.
7. Remove 4 speaker nuts. Remove speaker.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
MEADE ST
DENVER, COLORADO



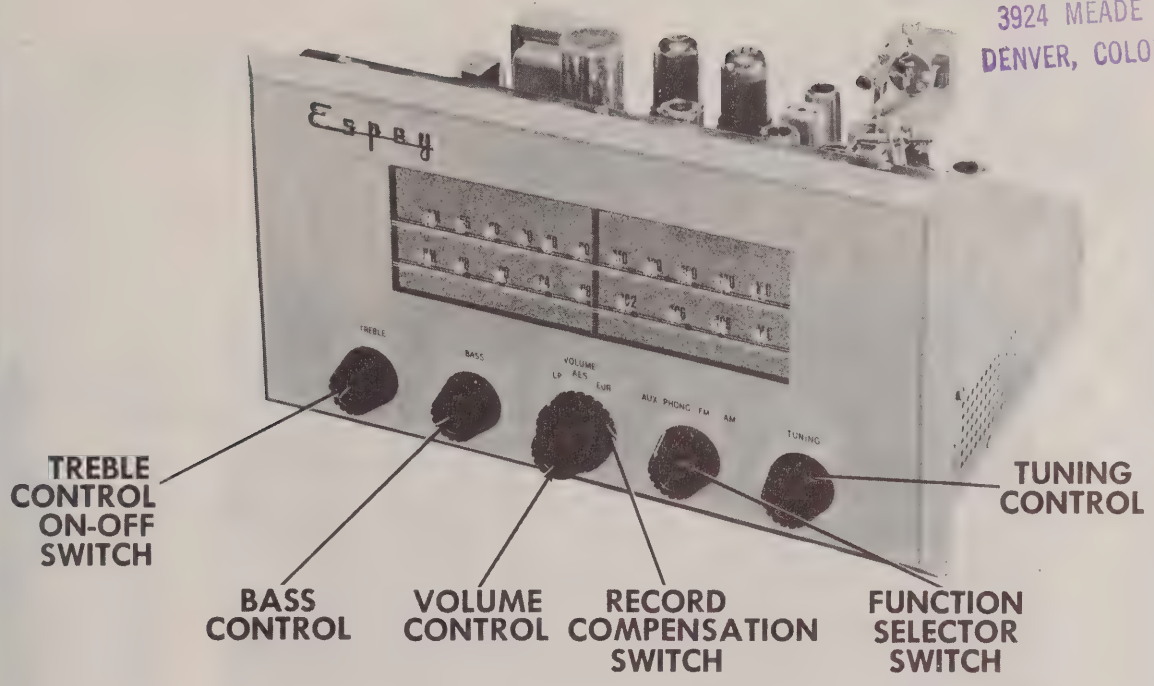
CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

RETMA MEMBER

ESPEY
MODEL 200

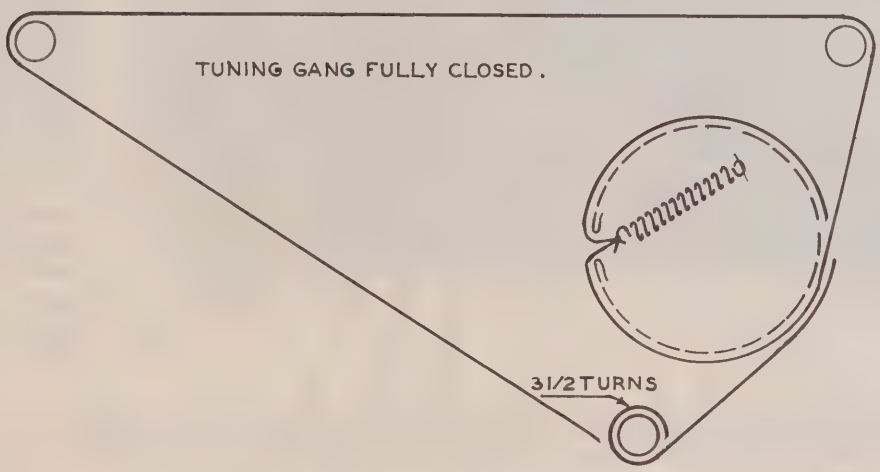
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ESPEY
MODEL 200



ESPEY
MODEL 200

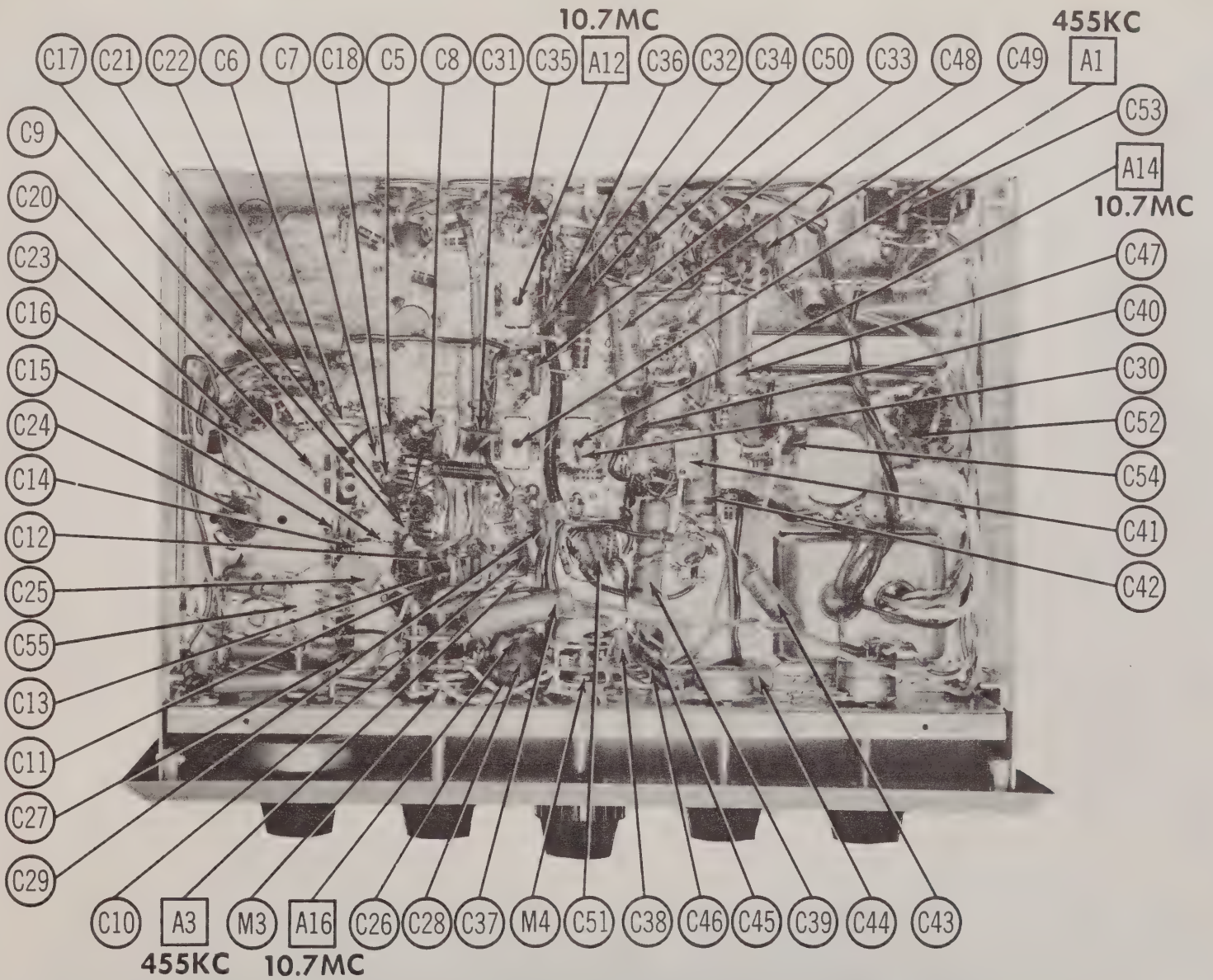
TRADE NAME	Espey Model 200	
MANUFACTURER	Espey Mfg. Co., Inc., 528 E. 72nd. St., New York 21, N.Y.	
TYPE SET	AC Operated AM-FM Superheterodyne Receiver For Custom Installation	
TUBES	Fourteen	
POWER SUPPLY	110-120 Volts AC- 50/60 Cycles	RATING .78 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	535-1720KC	FREQ. MOD. 88-108MC



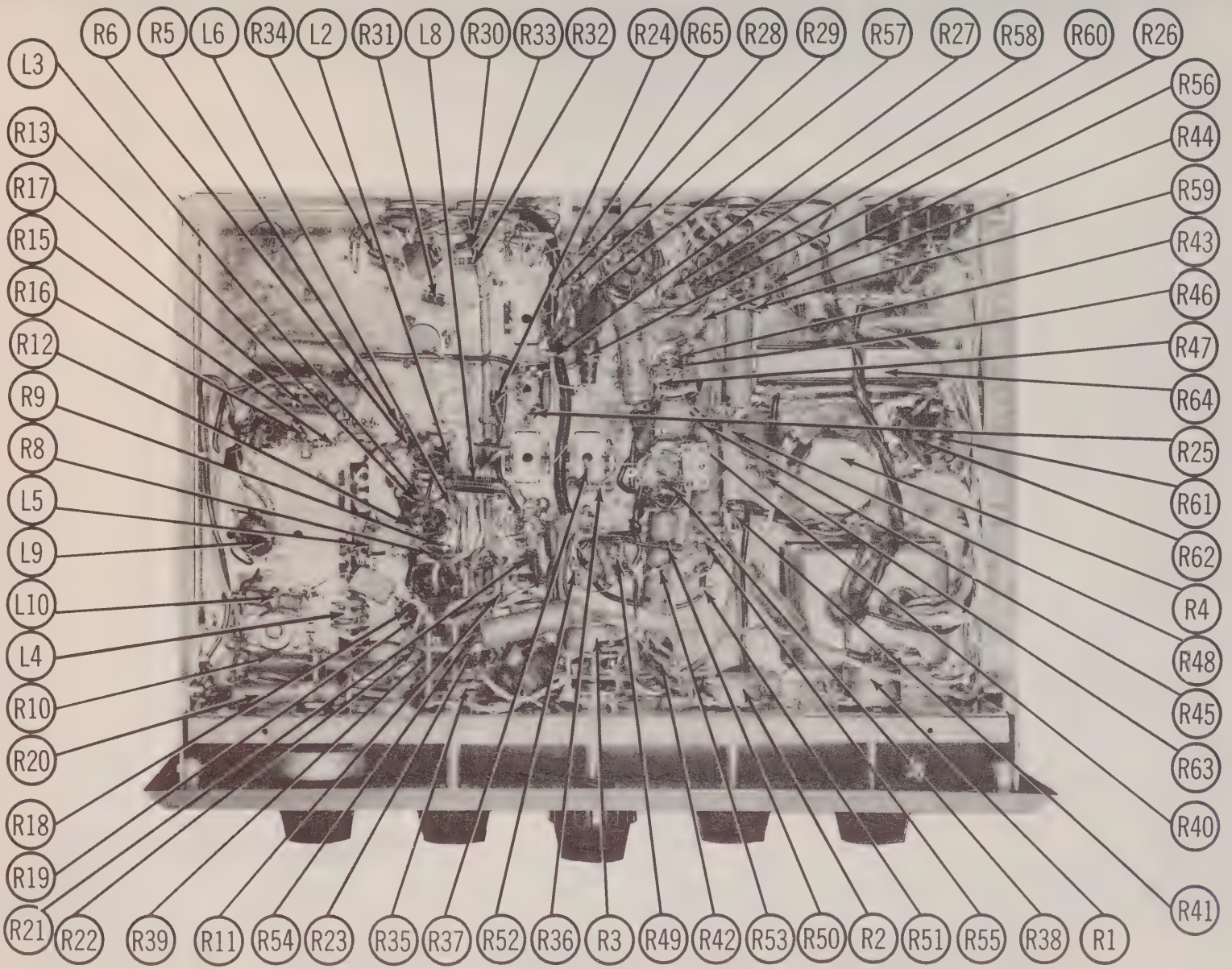
DRIVE CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
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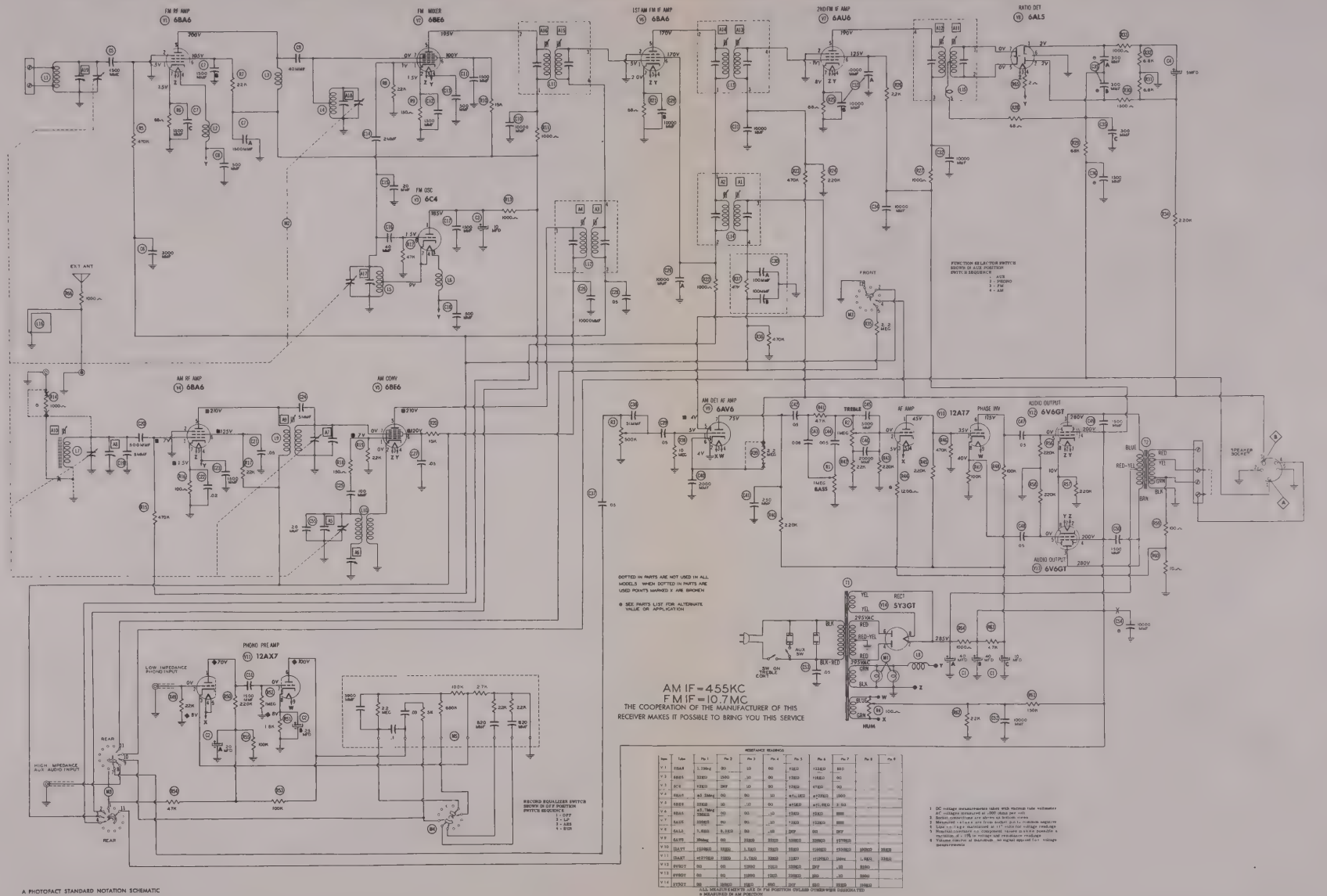
DENVER, COLORADO


FM RF AMP
V1 6BA6
FM MIXER
V2 6BE6
1ST AM FM IF AMP
V6 6BA6
2ND FM IF AMP
V7 6AU6
RATIO DET
V8 6AL5
FM OSC
V3 6C4
EXT ANT
AM RF AMP
V4 6BA6
AM CONV
V5 6BE6
AM DET AF AMP
V9 6AV6
TREBLE
AF AMP
V10 12AT7
PHASE INV
AUDIO OUTPUT
V12 6V6GT
AUDIO OUTPUT
V11 6V6GT
RECT
V14 5Y3GT
PHONO PRE AMP
V11 12AX7
LOW IMPEDANCE PHONO INPUT
HIGH IMPEDANCE AUX AUDIO INPUT
REAR
FRONT
SPEAKER SOCKET
BLUE
RED-YEL
BLK
BRN
HUM
SW ON TIMER CONT
AUX SW
FUNCTION SELECTOR SWITCH SHOWN IN AUX POSITION
SWITCH SEQUENCE
1 - AUX
2 - PHONO
3 - FM
4 - AM
RECORD EQUALIZER SWITCH SHOWN IN OFF POSITION
SWITCH SEQUENCE
1 - OFF
2 - LP
3 - AES
4 - RCP
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
AM IF=455KC
FM IF=10.7MC
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
RESISTANCE READINGS
1 DC voltage measurements taken with vacuum tube voltmeter
2 AC voltage measured at 1000 cycles per volt
3 Socket connections are shown as bottom views
4 Measured values are from socket pin to common negative
5 Line voltage maintained at 117 volts for voltage readings
6 Readings obtained on completely tuned receiver with a minimum signal
7 Volume control at maximum, no signal applied for voltage measurements
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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247-4

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

With tuning gang fully closed set the dial pointer to the small index mark (gold mark) just to the left of "55" on the dial.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Set treble and bass controls fully clockwise.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

AM ALIGNMENT

Attenuate generator output to maintain 0.5 watt output meter indication. 0.5 watt is approximately 1.4 volts deflection across a 4Ω voice coil and 2 volts across the 8Ω voice coil.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (grid) of 6BA6 (V6). Low side to chassis.	455KC (400∿Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output.
2.	"	High side to pin 7 (grid) of 6BE6 (V5). Low side to chassis.	"	"	"	"	A3, A4	"
3.	5MMF	High side thru 5MMF to AM antenna socket. Low side to chassis.	1700KC	"	1700KC	"	A5	"
4.	"	"	550KC	"	550KC	"	A6	Adjust for maximum output. Repeat steps 3 and 4 until proper oscillator tracking is obtained.
5.	"	"	1550KC	"	1550KC (Small index mark just to right of "150" on dial)	"	A7, A8	Adjust for maximum output.
6.	"	"	600KC	"	600KC	"	A9, A10	Adjust for maximum output. Repeat steps 5 and 6 until proper RF tracking is obtained.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (grid) of 6AU6 (V7). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
8.	"	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A12	Adjust for maximum deflection. Repeat steps 7 and 8.
9.	"	High side to pin 1 (grid) of 6BA6 (V6). Low side to chassis.	"	"	"	"	A13, A14	Adjust for maximum deflection. Attenuate generator output to maintain not more than -1.5 volts at VTVM.
10.	"	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	"	"	"	"	A15, A16	Adjust for maximum deflection. Repeat steps 9 and 10.

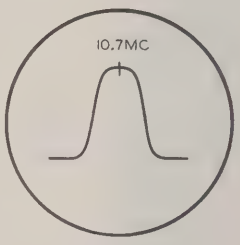


FIG. 1

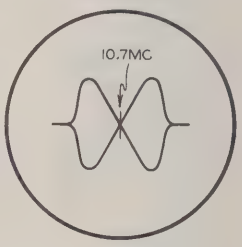


FIG. 2

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.
Use only enough generator output to provide useable pattern on scope.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (grid) of 6BA6 (V6). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓑ. Low side to chassis.	A12, A13, A14	Disconnect stabilizing capacitor C4. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
8.	"	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	"	"	"	"	A15, A16	"
9.	"	"	"	"	"	Vert. Amp. to point Ⓐ. Low side to chassis.	A11	Reconnect stabilizing capacitor C4. Adjust so that 10.7MC occurs at center of cross-over lines as in Fig. 2. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines. Continue alignment with step 11.

FM RF ALIGNMENT

Attenuate generator output to maintain -1.5 volts on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna receptacle. Low side to chassis.	108MC (Unmod)	FM	108MC	DC probe to point Ⓑ. Common to chassis.	A17	Adjust for maximum deflection.
12.	"	"	88MC	"	88MC	"		Use tuning wand. If necessary, compress or expand L5 for maximum deflection. Repeat steps 11 and 12 until proper oscillator tracking is obtained.
13.	"	"	106MC	"	106MC	"	A18, A19	Adjust for maximum deflection.
14.	"	"	90MC	"	90MC	"		Check L4 and L1 with tuning wand. If necessary compress or expand coil turns for maximum deflection. If necessary, repeat steps 13 and 14 until proper RF tracking is obtained.

HUM BALANCE ADJUSTMENT

If it becomes necessary to readjust the hum balance control (R4A) allow a 10 minute warm-up period with record player disconnected and perform the following operations:

a. Set function switch to "Phono" position.
b. Set record equalizer to "AES" position
c. Turn volume control fully clockwise.
d. Reverse line plug in AC outlet and leave in that position which gives least residual hum.
e. Adjust R4A for MINIMUM background noise residual hum.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

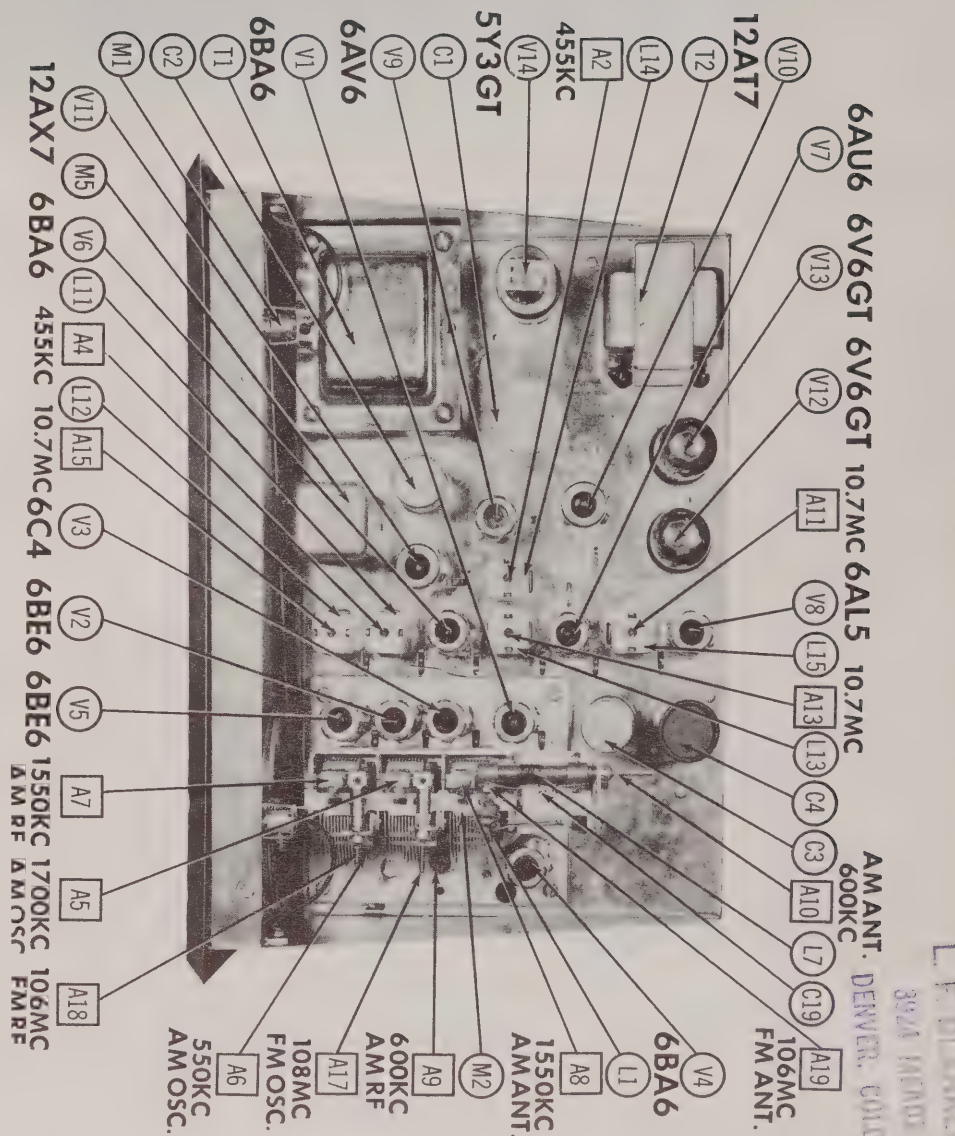
ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ESPEY PART No.	STANDARD REPLACEMENT		
V1	FM RF Amplifier	6BA6	6BA6	7BK	
V2	FM Mixer	6BE6	6BE6	7CH	
V3	FM Oscillator	6C4	6C4	6BG	
V4	AM RF Amplifier	6BA6	6BA6	7BK	
V5	AM Converter	6BE6	6BE6	7CH	
V6	1st. AM FM IF Amp	6BA6	6BA6	7BK	
V7	2nd. FM IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	AM Det. AF Amp.	6AV6	6AV6	7BT	
V10	AF Amp. Phase Inverter	12AT7	12AT7	9A	
V11	Phono Pre-Amp.	12AX7	12AX7	9A	
V12	Audio Output	6V6GT	6V6GT	7S	
V13	Audio Output	6V6GT	6V6GT	7S	
V14	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ESPEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲40	450		AFH3-43		C034		FP376.8	TVL-3785	
B	■40	450								
C	▲10	450								
C2A	▲20	450		AFH3-136		B040		FP234	TVL-3749	
B	■25	50						TC30		
C3	10	450		AFH1-48		A043		FP231	TVL-1705	
C4	5	250		PRS250/4		BR425		TC50X	TVA-1501	
C5	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C6	3000			SI3000	D6-302		GP2-333-302	UC-523	5GA-D3	
C7A	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
B	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	Note 1
C C	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C8	500			SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	
C9	40									
C10	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C11	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C12	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C13	500			SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	
C14	2									
C15	20			SI20NP0	TCZ-20	TZ13	NP0K-200	ZT-542	5TCC-Q2	
C16	40									
C17	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C18	500			SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	
C19	5			SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C20	500			SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	
C21	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C22	.02	200		P288-02	DD-203	PJ2S2		PT412	2TM-S2	
C23	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5GA-D15	
C24	5			SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C25	100	500		1468-0001		5W5T1		MC235	1FM-31	
C26	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C27	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C28	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C29A	10000			BPD-2X01	DD3-103	DK082	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C30A	100			♦PA-97-1	♦PC-50	♦111TM1	♦1403-01	UC-531	♦100C1	
B	100							UC-531		
C31	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C32	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C33A	10000			BPD-2X01	DD3-103	DK082	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C34	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C35A	300			SI300	D6-301	TP42	GP1K-301	UC-533	5GA-T3	
B	300			SI300	D6-301	TP42	GP1K-301	UC-533	5GA-T3	Note 2
C	300			SI300	D6-301	TP42	GP1K-301	UC-533	5GA-T3	
C36	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	Note 3

CHASSIS—TOP VIEW


6AU6 6V6GT 6V6GT 10.7MC 6AL5 10.7MC
12AT7
5Y3GT
455KC
6BA6
6AV6
12AX7 6BA6 455KC 10.7MC 6C4 6BE6 6BE6 1550KC 1700KC 106MC
AM RF AM OSC FM RF
V10 V7 V13 V12 A11 V8 L15 A13 L13 C4 C3 A10 L7 C19 A19
106MC FM ANT.
AM ANT. 600KC
V4 6BA6
L1 1550KC AM ANT.
A8
M2 600KC AM RF
A9
A17 108MC FM OSC.
A6 550KC AM OSC.
M1 C2 T1 V1 C1 V14 A2 L14 T2 V9
V11 M5 V6 L11 A4 L12 A15 V3 V2 V5 A7 A5 A18

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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ESPEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C37	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C38	51									
C39	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C40	2000			SI2000	D6-202	TP56	GP2L-202	UC-522	5HK-D2	
C41	250	500		1468-00025		5W5T25		MC240	1FM-325	
C42	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C43	.006	600		P688-006	D6-602	CUB6D6	GP2-333-602	PT626	6TM-D6	
C44	.005	600		P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C45	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C46	20000			BPD-02		K085				
C47	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C48	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C49	1500	1500		HVD15-0015			1R5KV-152	MCK215		
C50	1500	1500		HVD15-0015			1R5KV-152	MCK215		
C51	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C52	10000			BPD-01	DD-103	K080	811-01	DC-511	5HK-S1	
C53	.05	400		489ZX-05		PJ4S5		PT415	4TM-S5	
C54	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	Note 4
C55	20			SI20NP0	TCZ-20	TZ-13	NP0K-200	ZT-542	5TCC-Q2	

♦ Items C30A, C30B and R37 are combined in one unit.
Note 1. Items C7A, C7B and C7C are combined in one unit.
Note 2. Items C35A, C35B and C35C are combined in one unit.
Note 3. Some models may use a 1000MMF in this application.
Note 4. Not used in all models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ESPEY PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	A9.317-A	Q13-137	A47-1Meg-Z	B-70-S	U-53	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A
R2A	1Meg	½	A9.316-A	Q11-137	A47-1Meg-S	B-69	U-54	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3	500KΩ	½	B9.311-A					Volume & switch
R4A	100Ω	2	A9.310-A	W-100	A43-100	VK-121	R100L	Hum balance-wire wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ESPEY PART No.	IRC PART No.	NOTES
R5	470KΩ	½		BTS-470K	
R6	68Ω	½		BTS-68	
R7	22KΩ	1		BTA-22K	
R8	22KΩ	½		BTS-22K	
R9	150Ω	½		BTS-150	
R10	15KΩ	2		BTB-15K	
R11	1000Ω	½		BTS-1000	
R12	47KΩ	½		BTS-47K	
R13	1000Ω	½		BTS-1000	
R14	1000Ω	½		BTS-1000	Note 2
R15	470KΩ	½		BTS-470K	
R16	100Ω	½		BTS-100	
R17	22KΩ	1		BTA-22K	
R18	150Ω	½		BTS-150	
R19	22KΩ	½		BTS-22K	
R20	15KΩ	2		BTB-15K	
R21	68Ω	½		BTS-68	
R22	1000Ω	½		BTS-1000	
R23	470KΩ	½		BTS-470K	
R24	220KΩ	½		BTS-220K	
R25	68Ω	½		BTS-68	
R26	22KΩ	1		BTA-22K	
R27	1000Ω	½		BTS-1000	
R28	68Ω	½		BTS-68	
R29	68KΩ	½		BTS-68K	
R30	1500Ω	½		BTS-1500	
R31	6800Ω	½		BTS-6800	
R32	6800Ω	½		BTS-6800	
R33	1000Ω	½		BTS-1000	
R34	220KΩ	½		BTS-220K	
R35	2. 2 Meg	½		BTS-2. 2Meg	
R36	470KΩ	½		BTS-470K	
R37	47KΩ	½		BTS-47K	
R38	10 Meg	½		BTS-10 Meg	
R39	2. 2 Meg	½		BTS-2. 2 Meg	
R40	220KΩ	½		BTS-220K	
R41	47KΩ	½		BTS-47K	
R42	22KΩ	½		BTS-22K	
R43	220KΩ	½		BTS-220K	
R44	1200Ω	½		BTS-1200	Note 1
R45	220KΩ	½		BTS-220K	
R46	470KΩ	½		BTS-470K	
R47	100KΩ	½		BTS-100K	
R48	100KΩ	½		BTS-100K	
R49	22KΩ	½		BTS-22K	
R50	220KΩ	½		BTS-220K	
R51	1800Ω	½		BTS-1800	
R52	1 Meg	½		BTS-1 Meg	
R53	100KΩ	½		BTS-100K	
R54	47KΩ	½		BTS-47K	
R55	100KΩ	½		BTS-100K	
R56	220KΩ	½		BTS-220K	
R57	220Ω	2			
R58	220KΩ	½		BTS-220K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ESPEY PART No.	IRC PART No.	NOTES
R59	100Ω	½		BTS-100	
R60	10Ω	½		BTS-10	
R61	150KΩ	½		BTS-150K	
R62	22KΩ	½		BTS-22K	
R63	47KΩ	½		BTS-47K	
R64	1000Ω	15			
R65	2Ω	½			
R66	1000Ω	½		BTS-1000	

♦ Items R37, C30A, C30B are combined in one unit.
Note 1. Some models may use a 2200Ω resistor in this application.
Note 2. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA ESPEY PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @.78A	576VCT .126ADC	5VAC @2A	B18.126						T-25R16
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC @.85A	6.3VAC @3.5A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ESPEY PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T2	20KΩ CT	500Ω tap @ 8Ω, 4Ω	B15.148					T-25S02	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ESPEY PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant.Coil	0Ω (tapped)		A2.241				
L2	Fil. Choke	0Ω		2.703	19-1001	TV-189	4604	1.5 Microhenries - IRC part #CLA
L3	FM RF Choke	1.2Ω		32.402	19-1003		4608	4 Microhenries
L4	FM RF Coil	0Ω (tapped)		A2.580				
L5	FM Osc.Coil	0Ω (tapped)		B2.735				
L6	Fil.Choke	0Ω		2.703	19-1001	TV-189	4604	1.5 Microhenries- IRC part #CLA
L7	AM Ant.Coil	1.8Ω		2.699			6300	
L8	Fil. Choke	0Ω		2.703	19-1001	TV-189	4604	1.5 Microhenries- IRC part #CL-1
L9	AM RF Coil	100Ω	2.6Ω	B2.409	14-1072	BC-382	A-5495-RF	
L10	AM Osc.Coil	.8Ω	7.5Ω	A2.698			71-Osc.†	
L11	1st.FM IF	.7Ω	.7Ω	2.415	16-3487	FM-254	1463	
L12	1st.AM IF	9.5Ω	9.5Ω	2.414	16-6758	BC-352	12-C21	
L13	2nd.FM IF	.7Ω	.7Ω	2.415	16-3487	FM-254	1463	
L14	2nd.AM IF	9.5Ω	9.5Ω	2.414	16-6758	BC-353	12-C2	
L15	Ratio Det.	1.7Ω	.9ΩCT	2.474	17-3488 *	FM-255	1465	Tertiary winding-.4Ω
L16	AM Loop Ant.	.8Ω						Not used in all Models

† Drill mounting hole.
* Cut out chassis hole and drill mounting holes.

MISCELLANEOUS

ITEM No.	PART NAME	ESPEY PART No.	NOTES
M1	Dial Light		#47 (2 used)
M2	Tuning Cap.	B6.070	
M3	Switch	B12.296	Function Selector
M4	Switch	B9.311	Record equalizer
M5	RC network		Record equalizer
A6	Trimmer Cap.	C13.518	500-1000MMF

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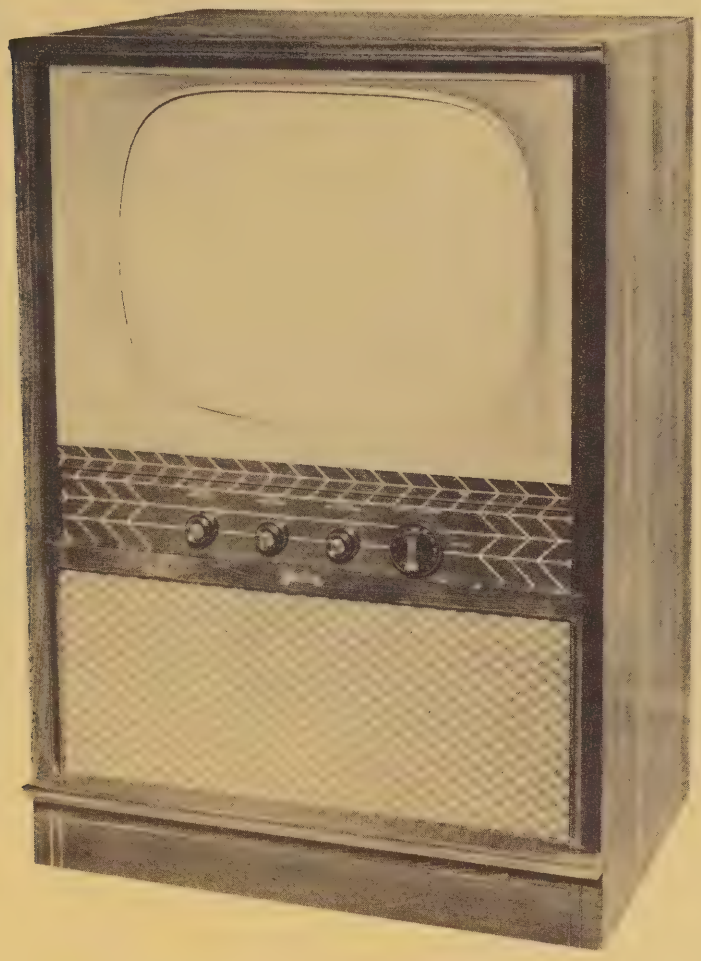

MODEL 542C

FADA
MODELS H274T, H276T, H442C, H542C

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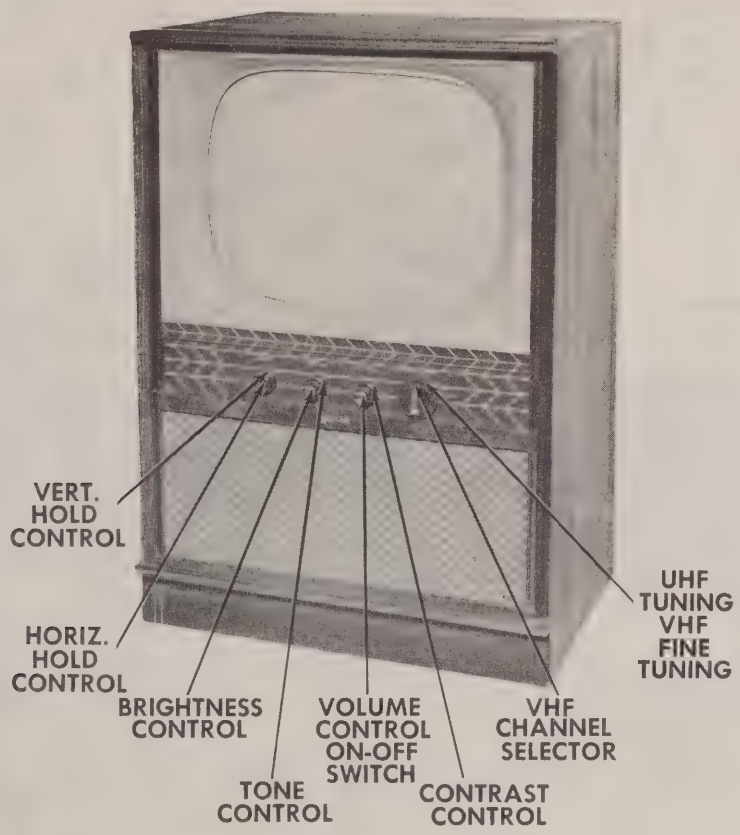

FADA MODEL H542C

TRADE NAME	Fada Models H274T, H276T, H442C, H542C
MANUFACTURER	Fada Radio & Electric Co., Inc., 525 Main St., Belleville, N.J.
TYPE SET	Television Receiver
TUBES	Twenty-three
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 2.46 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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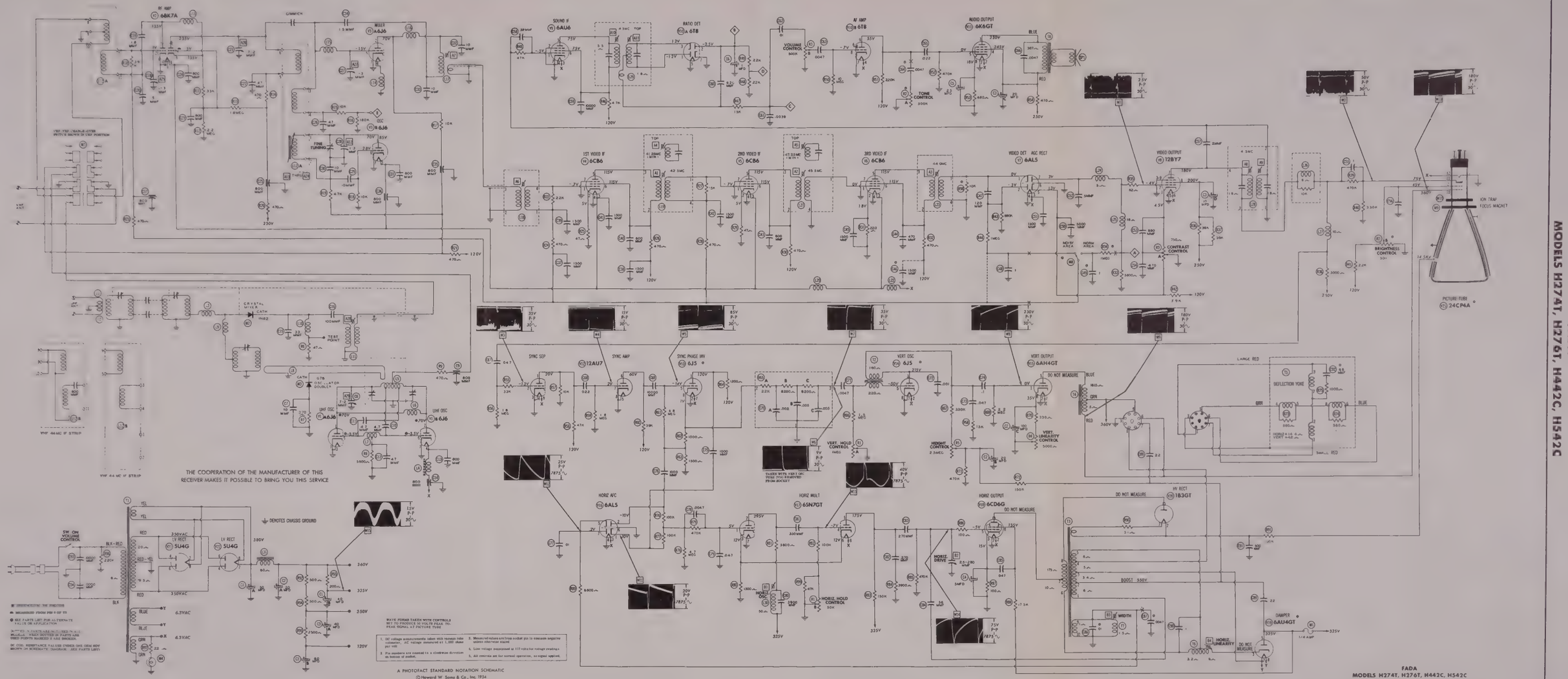

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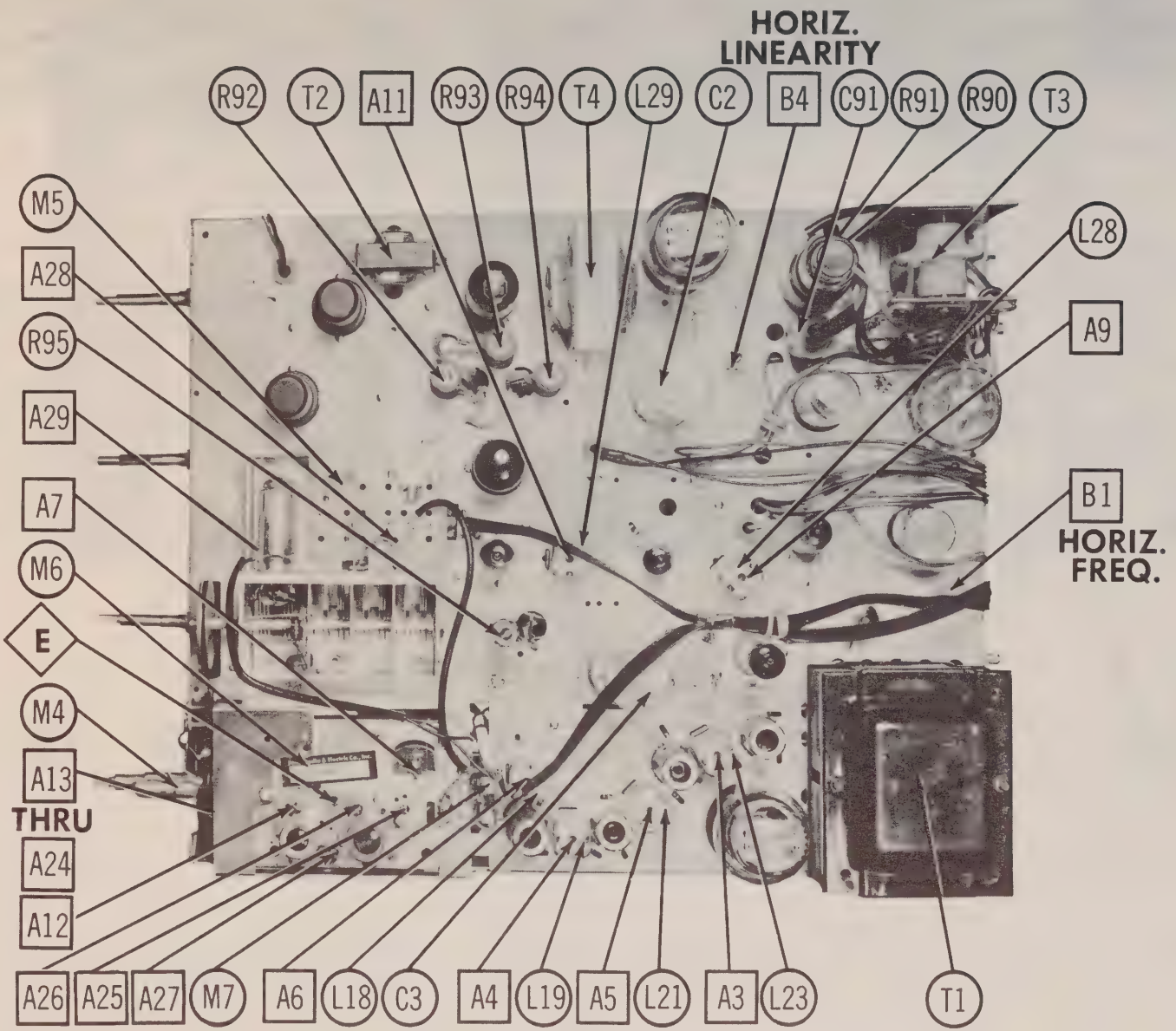

CHASSIS TOP VIEW

MODELS H2741, H2761, H442C, H542C

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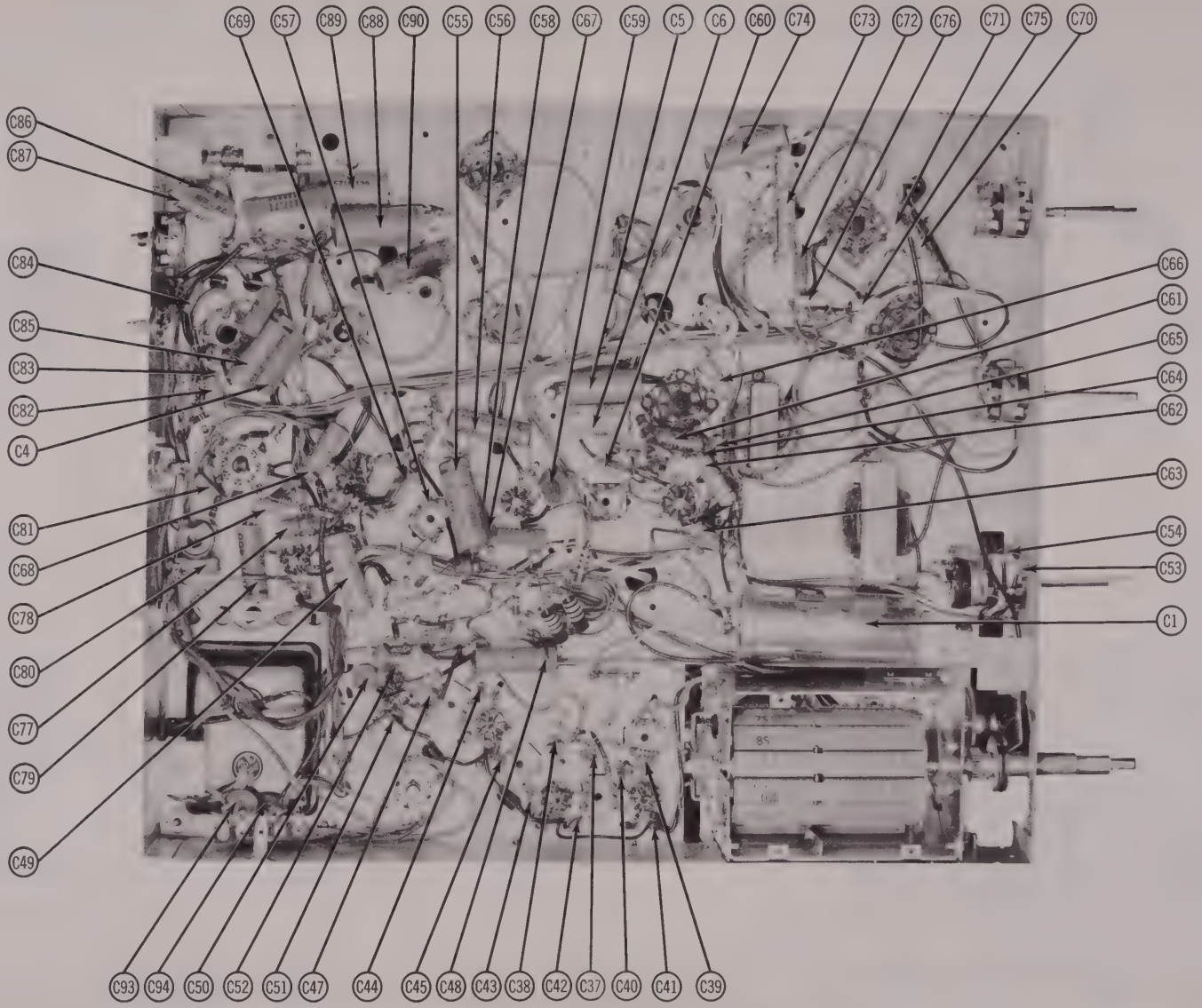

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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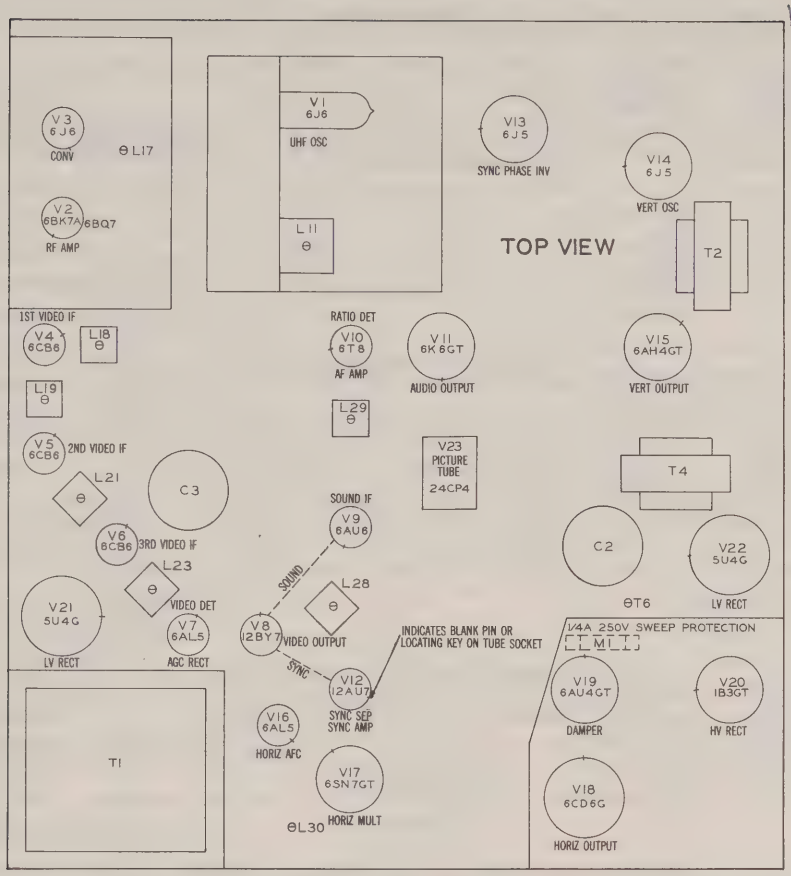

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V21, V22

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, V8 (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V8, V23
Has pic, no sound - V9, V10, V11

SYNC FAILURE
No vert. sync - V13, V14
No horiz. sync - V13, V16, V17
No vert. or horiz. sync - V12, V13

SWEEP FAILURE
No raster, has sound - V17, V18, V19, V20, V23, Fuse (M1)
No vertical deflection - V14, V15
Poor vert. linearity or foldover - V14, V15
Poor horiz. linearity or foldover - V17, V18, V19
Narrow picture - V17, V18, V19, V20, V21, V22
Vert. off freq. - V13, V14
Horiz. off freq. - V14, V16, V17

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V17) to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias to the ungrounded side of C37. Connect positive lead to chassis.
Set the contrast control to its mid-range position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD Ceramic Capacitor	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis. Use short leads.	42.5MC (Unmod)	Any non-interfering channel	DC probe thru 47KΩ to point (A). Common to chassis.	A1	Attenuate generator output to maintain not more than 2 volts at VTVM. Adjust for maximum deflection.
2.	"	"	45.5MC	"	"	A2	"
3.	"	"	44.0MC	"	"	A3	"
4.	"	"	41.25MC	"	"	A4	Adjust for MINIMUM deflection.
5.	"	"	47.25MC	"	"	A5	Adjust for MINIMUM deflection. Repeat steps 1 thru 5.

OVERALL VIDEO IF RESPONSE CHECK

Remove the converter tube (V3) from its socket and replace with a 6J6 which has Pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
If the sweep generator output is too low to give a useable indication the scope reduce the bias (connect as under "Video IF alignment") to 3 volts.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.001MFD Ceramic Capacitor	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis. Use short leads.	44MC (10MC Swp)	41.25MC 42.25MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 15KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, retouch A1, A2 and A3 to obtain desired response. Attenuate generator output for 1 volt peak to peak on scope.
7.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	"	"	Any	"	A6, A7	Adjust A6 and A7 for maximum response at center of pass band (44MC) and to position the 42.25MC and 45.75MC markers as in Fig. 2. If necessary SLIGHTLY retouch A1, A2 and A3 to obtain desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru 47KΩ to point (B). Common to chassis.	A8, A9, A10	Adjust for maximum deflection.
9.	"	"	"	"	DC probe thru 47KΩ to point (C). Common to point (D).	All	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru 47KΩ to point (B). Low side to chassis.	A8, A9, A10	Disconnect stabilizing capacitor C6. Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
9.	"	"	"	"	"	Vert. Amp. thru 47KΩ to point (C). Low side to chassis.	All	Reconnect stabilizing capacitor C6. Adjust so that 4.5MC occurs at center of cross-over lines as in Fig. 4. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

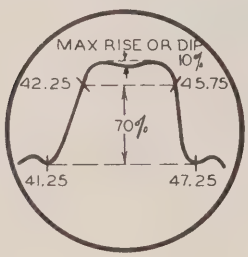

FIG.1

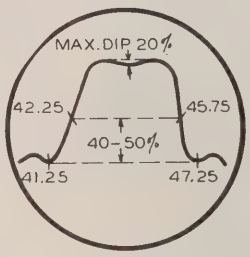

FIG.2

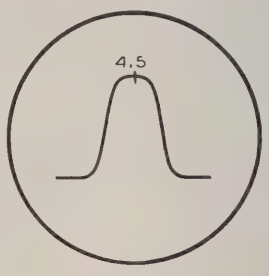

FIG.3

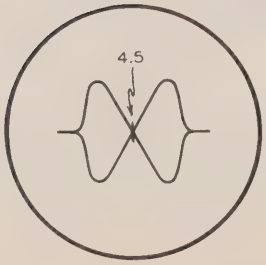

FIG.4

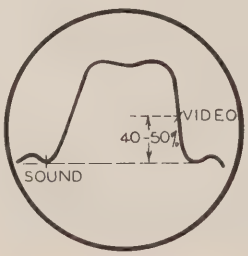

FIG.5

FIG.6

ALIGNMENT INSTRUCTIONS (cont)

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OSCILLATOR ALIGNMENT

Leave the bias supply connected as under "Video IF alignment".
Remove the dummy converter tube and replace the original 6J6 in its socket. Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step A12.
It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A12 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across VHF antenna leads with 120Ω in each lead	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 15KΩ to point (A). Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 40-50%.
			213MC (10MC Swp)	211.25MC 215.75MC	13		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

RF AND MIXER ALIGNMENT

Leave bias supply connected as under "Video IF alignment" except use a 3 volt instead of a 4.5 volt battery.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (E). Low side to chassis.	A25,A26 A27	Adjust for response curve similar to Fig. 6.
12.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 6. If markers fall below 70% on any channel make compromise adjustments of A25, A26 and A27 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

UHF TUNER 44MC IF COIL ALIGNMENT

Turn the channel selector knob to "UHF" position. Leave the bias battery connected as under "Video IF alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead	677MC (10MC Swp)	675.25MC 679.75MC	48	Vert. Amp. thru 15KΩ to point (A). Low side to chassis.	A28	Adjust for response curve similar to Fig.5.
14.	"	"	473MC (10MC Swp)	471.25MC 475.75MC	14	"		Check for response curve similar to Fig.5. If necessary, SLIGHTLY retouch A28 to obtain acceptable response.
15.	"	"	833MC (10MC Swp)	831.25MC 835.75MC	74	"		"

UHF OSCILLATOR ALIGNMENT

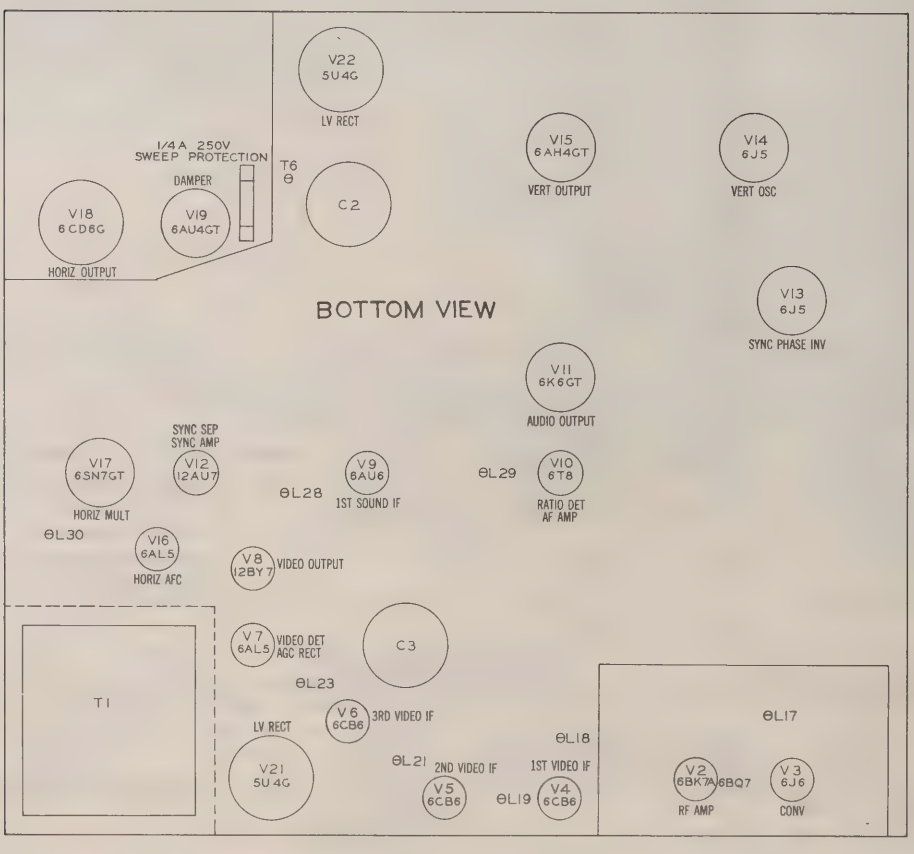
If an accurately calibrated UHF signal generator is not available the UHF oscillator may be aligned when a local UHF station is on the air. Tune to the known operating channel and adjust A29 for clearest picture and best sound. If satisfactory equipment is available proceed as shown in step 16.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	Not used	870MC	80	Use VTVM. DC probe thru 47KΩ to point (A). Common to chassis.	A29	Adjust for maximum deflection.

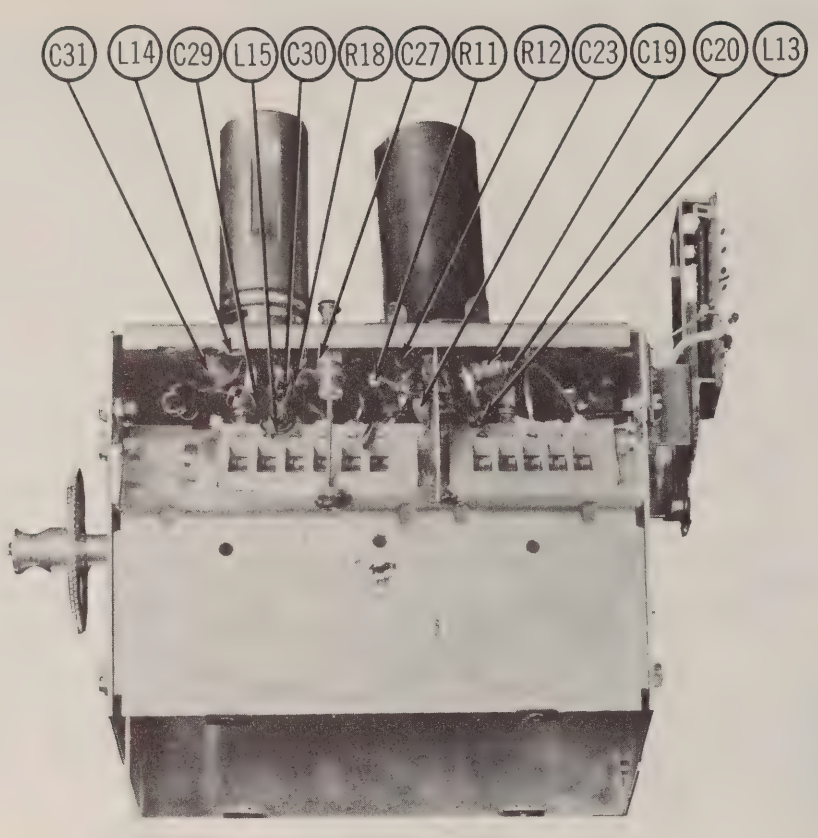
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	■†4.5KΩ	■†4.5KΩ	0Ω	.1Ω	5.6KΩ	5.6KΩ	0Ω		
V 2	6BK7A	1.1Meg	1.7Meg	0Ω	.1Ω	0Ω	†2KΩ	1.1Meg	1.1Meg	0Ω
V 3	6J6	†8.8KΩ	†14KΩ	.1Ω	0Ω	190KΩ	10KΩ	0Ω		
V 4	6CB6	1.7Meg	47Ω	.1Ω	0Ω	†4KΩ	†4KΩ	0Ω		
V 5	6CB6	1.7Meg	47Ω	.1Ω	0Ω	†4KΩ	†4KΩ	0Ω		
V 6	6CB6	.1Ω	220Ω	.1Ω	0Ω	†4KΩ	†4KΩ	0Ω		
V 7	6AL5	.1Ω	680K Ω	.1Ω	0Ω	400Ω	0Ω	5.6KΩ		
V 8	12BY7	280Ω	5.7KΩ	0Ω	0Ω	0Ω	.1Ω	†6KΩ	†20KΩ	0Ω
V 9	6AU6	47KΩ	0Ω	.1Ω	0Ω	†8.3KΩ	†8.3KΩ	0Ω		
V 10	6T8	INF	44KΩ	INF	.1Ω	0Ω	INF	0Ω	10Meg	†220KΩ
V 11	6K6GT	INF	.1Ω	†1.9KΩ	†1.5KΩ	470KΩ	500KΩ	0Ω	680Ω	
V 12	12AU7	†19KΩ	1.8Meg	0Ω	0Ω	0Ω	†43KΩ	1.8Meg	0Ω	.1Ω
V 13	6J5	0Ω	0Ω	†4.8KΩ	INF	6.8Meg	INF	.1Ω	2.5KΩ	
V 14	6J5	0Ω	.1Ω	◓1Meg	INF	2Meg	INF	0Ω	0Ω	
V 15	6AH4GT	2.2Meg	0Ω	INF	INF	†1.7KΩ	INF	.1Ω	2KΩ	
V 16	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	6.8KΩ	0Ω	6.8KΩ		
V 17	6SN7GT	5.2Meg	†5.9KΩ	1.5KΩ	130KΩ	†150KΩ	1.5KΩ	0Ω	.1Ω	
V 18	6CB6G	INF	.1Ω	100Ω	470KΩ	470KΩ	INF	0Ω	†17.7KΩ	TOP CAP ◓14Ω
V 19	6AU4GT	INF	INF	600KΩ	INF	†275Ω	†275Ω	◓6Ω	◓6Ω	
V 20	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ◓190Ω
V 21	5U4G	INF	20KΩ	INF	20Ω	INF	20Ω	INF	20KΩ	
V 22	5U4G	INF	20KΩ	INF	20Ω	INF	20Ω	INF	20KΩ	
V 23	24CP4	0Ω	†28KΩ	PIN 10 †70Ω	PIN 11 †230KΩ	PIN 12 .1Ω				

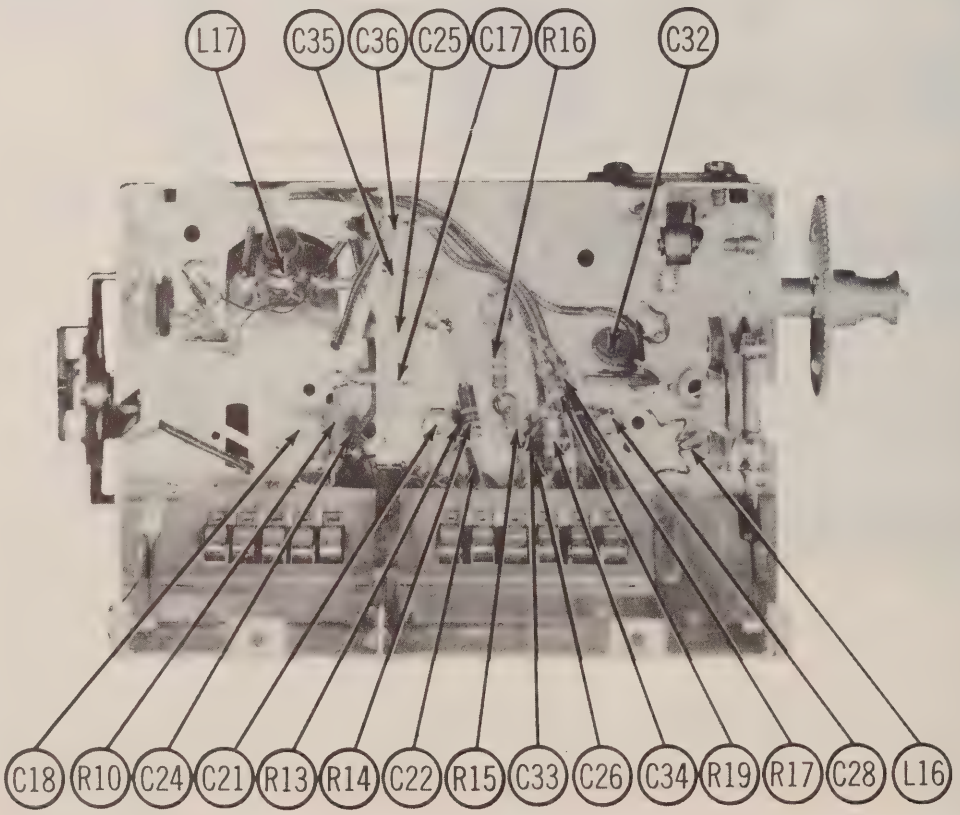
■ MEASURED IN UHF POSITION
† MEASURED FROM PIN 2 OF V22
◓ MEASURED FROM PIN 3 OF V19



TUBE PLACEMENT CHART



VHF TUNER-RIGHT SIDE



VHF TUNER-BOTTOM VIEW

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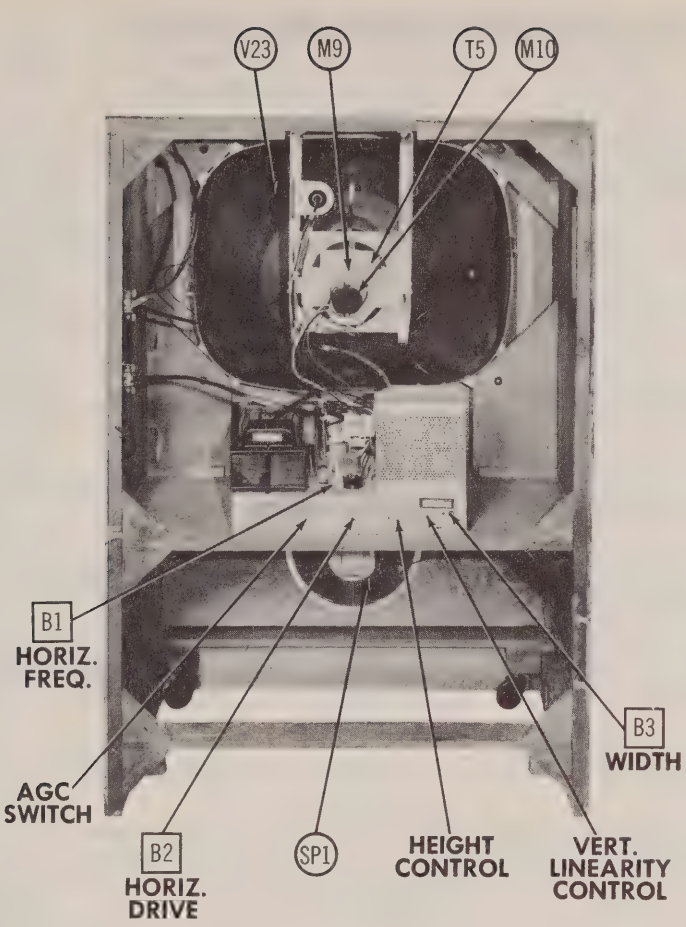

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to its mid-range position and adjust the horizontal oscillator slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS

1. Remove 9 push-on type control knobs from front panel.
2. Disconnect built-in antenna.
3. Remove 10 wood screws. Remove rear cover.
4. Remove 4 wood screws. Remove VHF-UHF transmission lines from top rear of cabinet.
5. Disconnect speaker leads, yoke plugs, CRT socket and HV plug.
6. Remove 1 metal screw from CRT mounting bracket. Remove HV plug.
7. Remove 4 chassis bolts. Remove chassis.
8. Remove 2 speaker nuts. Remove speaker.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V17, V18, V19, V21 and V22. Check adjustments B2, B3 and B4. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check C85, C88, C86, C87, C90, R88, T3, T5A and other associated components.	Check C82, C83, C84, R83, R85 and other associated components.

DRIVE LINES

Check adjustment B2. Check by substitution V17, V18 and V19. Check T3, T5A, C92, C89, C90, R75, R84, R85 and other associated components for failure or change of value.

COMPRESSED LEFT SIDE

Check adjustments B2, B3 and B4. Check by subsitution V18 and V19. Check components associated with the horizontal output and damper stages especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V18 and V19. Check C79 for open. Check T3, T5A, T6 and T7 for internal arcing.

XMAS TREE EFFECT

Substitute V17. Check L30, C80, C81 and other associated components for failure or change of value.

VERTICAL

LOSS OF SWEEP

Check by substitution V14 and V15. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R70, R4, and other associated circuit components.	Check R69, R67, R72, C74, T2 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V14 and V15. Check T4, T5B, C2C and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V14 and V15. Check T2, C73, C74, R68, R69 and other associated circuit components.

FOLDS

Check by substitution V14 and V15. Check associated components including T2, T4, T5B, C2C, C73, C74 and R69.

SYNC

LOSS OF HORIZONTAL AND VERTICAL SYNC

Substitute V12 and V13. Check R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, C67, C68 and C69. Check other associated circuit components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V12, V13 and V14. Check waveform W6.

If Satisfactory	If Unsatisfactory
Check components associated with V14 especially T2, C72, C71, and R66.	Check vertical integrator and other associated components. Check video amplifier and IF stages for overloading.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V16 and V17. Check R82, R99, C80, C81, C77, R89, R76, R77, C75, C76 and other associated components.

HORIZONTAL BENDING

Check by substitution V16, V17 and V18. Check C78, C79, R78 and R79. Check sync amplifier stages for 60 cycle modulation.

VIDEO

LOSS OF VIDEO

Check by substitution V7 and V8. Check peaking coils, plate load resistors, grid leak resistors, coupling capacitors, contrast control, picture tube and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best picture and sound. Check adjustments A8, A9 and video IF alignment.

POOR CONTRAST

Check by substitution V7 and V8. Check contrast control, picture tube and other associated components.

NEGATIVE PICTURE

Check by substitution V7, V8, V4, V5 and V2. Check components associated with the AGC network. Check other components associated with the video IF and amplifier stages. Check picture tube.

SMEAR

Check by substitution V7, V8, V6, V5 and V4. Check R36, R37, R38, R46, R47, L26, L27, C55, C3D, picture tube and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check V2, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10 and V11. Check stages V10B and V11 using audio signal generator. Apply audio signal across R50.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check R51, R52, R53, R54, C65, C66, T8, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A11 for minimum buzz. If still unsatisfactory, substitute V10 and realign ratio detector and audio IF stages. Check C6 for leakage.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: FADA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	UHF Oscillator	6J6	6J6	7BF	
V2	RF Amplifier	6BK7A	6BK7A	9AJ	Some models use 6BQ7
V3	Converter	6J6	6J6	7BF	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector-AGC Rectifier	6AL5	6AL5	6BT	
V8	Video Output	12BY7	12BY7	9BF	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector-AF Amplifier	6T8	6T8	9E	
V11	Audio Output	6K6GT	6K6GT	7S	
V12	Sync Separator-Sync Amplifier	12AU7	12AU7	9A	
V13	Sync Phase Inv.	6J5	6J5	6Q	Some Models use 6SN7 in place of V13 and V14
V14	Vert. Oscillator	6J5	6J5	6Q	
V15	Vert. Output	6AH4GT	6AH4GT	8EL	Some Models use 6S4
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6CD6G	6CD6G	5BT	
V19	Damper	6AU4GT	6AU4GT	4CG	Some Models use 6W4GT
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5U4G	5U4G	5T	
V22	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: FADA PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V23A	24CP4A	24CP4A	24CP4A	24CP4A		12N	
				24CP4		12N	
	24TP4					12N	
	27EP4	27EP4				12D	
	27RP4	27RP4	27RP4			12N	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FADA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲50	475	22.79	AFH3-54		C041		FP397	TVL-3843	
B	▲40	475								
C2A	■20	450	22.81	AFH4-80		D053		FP437	TVL-4740	
B	▲20	450								
C	100	50								
D	▲20	450								
C3A	▲40	450	22.90	AFH3-46		C037		FP378	TVL-3792	
B	▲80	350		PRS350/10		BR1235		TC62	TVA-1709	
C	■20	450								
D	10	350								
C4	5	50	22.56	PRS150/4		BR550		TC30	TVA-1303	
C5	25	50	22.66	PRS50/25		BR255		TC36	TVA-1306	
C6	1	150	22.70	PRS150/4		BR145		TC40	TVA-1402	
C7	10			SI10	D6-100	G018	GP1K-100	UC-541	5GA-Q1	
C8	.7-2				829-3		3115-01-0R5	CT565A		
C9	800			EF-001	MFT-1000				503C-D1	
C10	4.7									
C11	4.7									
C12	4.7									
C13	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C14	800			EF-001	MFT-1000					
C15	33			SI33NP0	TCZ-33	Z029	NP0K-330	ZT-5433	5TCC-Q33	
C16	100			BPD-0001	D6-101	G042	811-101	UC-531	5GA-T1	
C17	800			EF-001	MFT-1000				503C-D1	
C18	1-3				829-3		3115-01-0R5	CT565A		
C19	1.8									
C20	5									
C21	.7-2				829-3		3115-01-0R5	CT565A		
C22	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C23	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C24	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C25	800			EF-001	MFT-1000				503C-D1	
C26	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C27	1-3				829-3		3115-01-0R5	CT565A		
C28	1-3				829-3		3115-01-0R5	CT565A		
C29	10									
C30	10									
C31	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C32	10									
C33	10									
C34	1.5			SI1.5NP0	TCZ-1.5	TZ04	NP0K-1R5	ZT-5515	5TCCB-V15	
C35	800			EF-001	MFT-1000				503C-D1	
C36	800			EF-001	MFT-1000				503C-D1	
C37	1500		17.140	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C38	1500		17.140	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C39	1500		17.140	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C40	600		17.141		D6-601	TP49			5GA-T6	
C41	1500		17.140	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C42	1500		17.140	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C43	600		17.141		D6-601	TP49			5GA-T6	
C44	470		17.142	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C45	1500		17.140	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C46	1500		17.140	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	Note 1
C47	120		17.106	SI120	D6-121	TP35	GP2K-121	UC-5315	5GA-T12	
C48	.1	200	12.49	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C49	.1	200	12.49	P288-1	DF-104	CUB2P1		PT401	2TM-P1	Note 2

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FADA Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C80	5000		17.44	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C81	1500		17.140	BPD-0015	DD-152	K071	811-0015	DC-5215	5HK-D15	
C82	5		17.79	S15NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C83	680		17.106	S1680	DD-681	TP60	GP2K-681	UC-5368	5GA-T68	
C84	470		17.107	S1470	DD-471	TP46	GP2K-471	UC-5347	5GA-T47	
C85	.1	600	13.60	P688-1	DF-104	CUB6P1		PT60I	6TM-P1	
C86	.1	400	12.75	P488-1	DF-104	CUB4P1		PT40I	4TM-P1	
C87	3		17.59	S13.5NP0	TCZ-3.3	TZ05	NP0K-2R2		5TCCB-V33	
C88	39		17.105	S139	DD-390	TP25	GP1K-390	UC-5439	5GA-Q39	
C89	10000		17.80	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C90	530	500	17.125							
C91	.0038	500	13.71	P488-004	D6-402	CUB6D4	GP2-333-402	PT634	6TM-D4	
C92	.01	400	13.72	P488-01	D6-103	CUB4S1	GP2-333-103	PT41I	4TM-S1	
C93	.0047	400	13.68	P488-0047	D6-472	CUB4D47	GP2-333-472	PT6347	6TM-D47	
C94	.0047	600	13.68	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6347	6TM-D47	Note 3
C95	.022	400	13.82	P488-022	DF-203	CUB4S22	S17-02	PT4122	4TM-S22	
C96	.0047	400	13.68	P488-0047	D6-472	CUB4D47	GP2-333-472	PT6347	6TM-D47	
C97	.047	600	13.67	P688-047	DF-503	CUB4S47		PT4147	4TM-S47	
C98	.022	400	12.82	P488-022	DF-203	CUB4S22	S17-02	PT4122	4TM-S22	
C99	10000		17.80	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C70A	.003							PT632		
B	.005		e167.1	ePA-110	ePC-100	e115TM1	e1405-01	PT635	e10IC1	
C	.005							PT635		
C71	.0047	500	12.83	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6347	6TM-D47	
C72	.001	1000	12.120	P1088-001		CUB16D1		PT1631	MB-D1	
C73	.047	400	13.67	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C74	.1	400	12.75	P488-1	DF-104	CUB4P1		PT40I	4TM-P1	
C75	1000		17.109	S11000	D6-102	TP53	GP2L-102	UC-531	5HK-D1	
C76	1000		17.109	S11000	D6-102	TP53	GP2L-102	UC-531	5HK-D1	
C77	.01	400	13.72	P488-01	D6-103	CUB4S1	GP2-333-103	PT41I	4TM-S1	
C78	.0047	400	13.68	P488-0047	D6-472	CUB4D47	GP2-333-472	PT6347	6TM-D47	
C79	.047	400	13.67	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C80	3900	500	17.123	1464-004		1R5D39		MCB463	MB-S4	
C81	330	500	17.69	1469-00035		SR5T33				
C82	270	500	17.123	1469-0003		SR5T24		MCB241	MB-S3	
C83	270	500	17.123	1469-0003		SR5T27		MCB241	MB-S3	
C84	56	1000	17.139				3DV-560		20GA-Q56	
C85	.047	600	13.68	P688-047	DF-503	CUB6S47		PT6347	6TM-S47	
C86	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT41I	4TM-S1	Note 3
C87	.0047	400		P488-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	Note 3
C88	.22	400	13.77	P488-22		CUB4P22		PT4023	4TM-P22	
C89	.22	400	13.77	P488-22		CUB4P22		PT4022	4TM-P22	
C90	.1	400		P488-1		CUB4P1		PT40I	4TM-P1	
C91	500	30000	17.166	HV30C	TV3-502	MMU0207S	413	HV30035A	30DK-T5	
C92	68	1500	17.143	HVD15-000068		MCQ68	IR5KV-680		20GA-Q68	Note 4
C93	10000		17.144	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C94	10000		17.144	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	

Note 1. Not used in all Models.
Note 2. Not used in Models H276T and H442C.
Note 3. When C86 is .015MFD (part #12.73), C87 is not used.
Note 4. Some Models use 56MMF in this application.
* Items C70A, C70B, C70C, R65A, R65B, R65C are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FADA Part No	IRC Part No.	CLAROSTAT Part No.	CENTRALAB Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	1Meg	½	52.66	*QJ-168	RTV-110	SBB-510	UF16L	Vert. Hold (Panel)
B	50KΩ	½					UR54L †	Horiz. Hold (Rear)
R2A	500KΩ	½	52.70	**QJ-436	RTV-401		UF55A	Tone (Panel)-Note
B	50KΩ	½					UR54L ††	Brightness (Rear)
R3A	750Ω	2	52.64	■QJ-270	RTV-109		WF75I-T25I	Contrast - tapped ⑧ 500Ω-wire wound (Panel)
B	500KΩ	½					UR55A	Volume (Rear)
C	Switch						US-28	Attach to R3A
R4A	5000Ω	2	52.68	WK-5000	A43-5000	VK-135	R5000L	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A
R5A	2.5Meg	½	52.24	QU-239	A47-2.5Meg-S	AB-83	SU-566	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A

Note . Models H276T and H442C use a single control part #52.69.
* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B1J-137 & P1-126 (Panel)
B1J-123 & R1-212 (Rear).
** CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B1J-133 & P1-126 (Panel)
B1J-123 & R1-212 (Rear)
■ CONCENTRIKIT EQUIVALENT KIT K-3 BASE ELEMENTS & SHAFTS W17-105X & P4-124 (Panel)
B1J-133 & R1-212 (Rear) & SWITCH 76-1.
† Universal Replacement (Mallory exact duplicate part #UE160L)
†† Universal replacement (Mallory exact duplicate part #UE142S.
• Universal Replacement (Mallory exact duplicate part #UE22W8).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FADA Part No.	IRC Part No.	NOTES
R6	47Ω	½		BTS-47	
R7	270Ω	½		BTS-270	
R8	5600Ω	½		BTS-5600	
R9	470Ω	½		BTS-470	
R10	3900Ω	½		BTS-3900	
R11	33KΩ	½		BTS-33K	
R12	2.2 Meg	½		BTS-2.2 Meg	
R13	1.8 Meg	½		BTS-1.8 Meg	
R14	470Ω	½		BTS-470	
R15	10KΩ	½		BTS-10K	
R16	180KΩ	½		BTS-180K	
R17	10KΩ	½		BTS-10K	
R18	10KΩ	½		BTS-10K	
R19	4700Ω	½		BTS-4700	
R20	470Ω	½	32.173	BTS-470	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FADA Part No.	IRC Part No.	NOTES
R21	470Ω	½	32.173	BTS-470	
R22	22KΩ	½	32.13	BTS-22K	
R23	470Ω	½	32.173	BTS-470	
R24	470Ω	½	32.173	BTS-470	
R25	470	½	32.197	BTS-47	
R26	470Ω	½	32.173	BTS-470	
R27	15KΩ	½	32.13	BTS-15K	
R28	470Ω	½	32.173	BTS-470	
R29	470	½	32.197	BTS-47	
R30	470Ω	½	32.173	BTS-470	
R31	220Ω	½	32.5	BTS-220	
R32	470Ω	½	32.173	BTS-470	
R33	5600Ω	½	32.128	BTS-5600	
R34	1 Meg	½	32.33	BTS-1 Meg	Note 1
R35	82Ω	½	32.125	BTS-82	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FADA Part No.	IRC Part No.	NOTES
R36	39KΩ	2	32.660	BTB-39K	
R37	39KΩ	2	32.660	BTB-39K	
R38	5000Ω	10	117.80		
R39	470KΩ	½	32.92	BTS-470K	
R40	330KΩ	½	32.205	BTS-330K	
R41	22KΩ	½	32.183	BTS-22K	
R42	39KΩ	½	32.103	BTA-39K	
R43	680KΩ	½	32.35	BTS-680K	
R44	1 Meg	½	32.33	BTS-1 Meg	
R45	47KΩ	½	32.15	BTS-47K	
R46	470Ω	½	32.74	BTA-470Ω	
R47	15KΩ	½	32.13	BTS-15K	
R48	22KΩ	½	32.13	BTS-22K	
R49	22KΩ	½	32.13	BTS-22K	
R50	10 Meg	½	32.99	BTS-10 Meg	
R51	220KΩ	½	32.18	BTS-220K	
R52	470KΩ	½	32.92	BTS-470K	
R53	680Ω	1	32.115	BTA-680	
R54	470Ω	½	32.399	BTA-470	
R55	33K	½	32.14	BTS-33K	
R56	1.8 Meg	½	32.308	BTS-1.8 Meg	
R57	10KΩ	½	32.11	BTS-10K	
R58	47KΩ	½	32.15	BTS-47K	
R59	1.8 Meg	½	32.308	BTS-1.8 Meg	
R60	39KΩ	½	32.103	BTA-39K	
R61	8.8 Meg	½	32.46	BTS-8.8Meg	
R62	1000Ω	½	32.8	BTS-1000	
R63	1500Ω 5%	½	32.117	BTS-1500 5%	
R64	1200Ω 5%	½	32.39	BTS-1200 5%	
R65A	22KΩ	½		BTS-22K	
B	8200Ω	½	• 167.1	BTS-8200	
C	8300Ω	½		BTS-8200	
R66	1.5 Meg	½		BTS-1.5 Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FADA Part No.	IRC Part No.	NOTES
R67	330KΩ	½	32.205	BTS-330K	
R68	15KΩ	½	32.12	BTS-15K	
R69	2.2 Meg	½	32.34	BTS-2.2 Meg	
R70	330Ω	½	32.67	BTS-330	
R71	470KΩ	½	32.92	BTS-470K	
R72	150KΩ	½	32.90	BTS-150K	
R73	560Ω	½	32.68	BTS-560	
R74	560Ω	½	32.68	BTS-560	
R75	1000Ω	½	32.8	BTS-1000	
R76	100KΩ	½	32.89	BTS-100K	
R77	100KΩ	½	32.89	BTS-100K	
R78	4.7 Meg	½	32.98	BTS-4.7Meg	
R79	470KΩ	½	32.92	BTS-470K	
R80	1500Ω 5%	½	32.265	BTS-1500 5%	
R81	560Ω	½	32.126	BTS-5600	
R82	100KΩ	½	32.89	BTS-100K	
R83	150KΩ	½	32.90	BTS-150K	
R84	3900Ω	½	32.202	BTS-3900	
R85	470KΩ	½	32.92	BTS-470K	
R86	100Ω	½	32.2	BTS-100	
R87	100Ω	5	117.94	1.5/4A-100	
R88	17.5KΩ	10	117.71	1.3/4A-17500	
R89	5800Ω	½	32.10	BTS-5800	
R90	5.1Ω	½	32.137		
R91	100KΩ	1	32.373	BTA-100K	
R92	500Ω	20	117.74	2D-500	
R93	300Ω	20	117.95	2D-200	
R94	500Ω	20	117.74	2D-500	
R95	2500Ω	25	117.83		
R96	220KΩ	1	32.375	BTA-220K	
R97	22Ω	½	32.165	BTS-22	
R98	10KΩ	½		BTS-10K	Note 2
R99	47KΩ	½		BTS-47K	

• Items R65A, R65B, R65C, C70A, C70B, C70C are combined in one unit.
Note 1. Not used in models H276T, H442C.
Note 2. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA FADA Part No.	Stancor Part No.	Merit Part No	Triad Part No.	RCA TYPE No.	Halldorson Part No.	Thordarson Part No.
T1	117VAC	700VCT	5VAC	42.61	P-8168①	P-3053①	R-62BC			
	⑨2.46A	.290ADC	⑤6A		②	③④				
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC	6.3VAC								
	⑨1.8A	⑨10A								

① Drill new mounting holes.
② Parallel and phase 6.3V ⑨ 5A winding Sec. #4.
③ Paralle and phase 6.3V ⑨ 7A. Sec. #4.
④ Parallel and phase 5V ⑨ 3A for Sec. #2.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA FADA Part No.	Stancor Part No.	Merit Part No.	Triad Part No.	RCA TYPE No.	Halldorson Part No.	Thordarson Part No.
T2	Vert. Osc. Trans.	42.53	A-81Ll	A-3000	A-97X ①	209T1	S6700	24A87
T3	Horiz. Output Trans.	37.280	A-8132 * &	HVO-9 * &	D-19 * &	225T1 * &	FB413 * &	
		37.264 ②	WC-5 ③	MWC-1④	WC-11④	214R1 ④	RF800③	
T4	Vert.Output Trans.	42.82	A-8141	A-3039	A-104X	226T1	21806	26854
		42.65 ⑤						
T5A	Yoke-Horiz.(11.5MH)	37.281		MDP-90⑧	Y-50-1	219D1⑧		Y-14
B	Vert. (40MH)							
T6	Horiz. Linearity (1.2-5MH) (Tapped)	37.244	WC-6	MWC-5⑦		209R1		WC-16 ⑦
T7	Width (.5-2MH)	37.248	WC-7	MWC-2⑦	WC-12 ⑧	206R1		WC-17

① Drill one new mounting hole.
② Alternate horizontal output trans.
③ Mount on side of high voltage cage.
④ Drill new mounting holes.
⑤ Alternate vert. output trans.
⑥ Use original yoke mount and leads.
⑦ Enlarge mounting hole.
⑧ Connect to coded green and red terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
	8	8	1B3 Rect. Plate Lead	1B3Rect. Plate Lead	1B3 Rect. Plate Lead	8	
	7	7	9	9	9	7	
	6	6		8	8	6	
	5	5	NC	7	7	5	
	4	4	5	5	5	4	
	3	3	4	4	4	3	
	2	2	3	3	3	2	
	1	NC	NC	NC	NC	NC	
Connect Width Coil Across	9 & 10	Pri. of WC-5 across 1 & 2	Pri. of MWC-1 across 1 & 3	Pri. of WC-11 across 1 & 3	Pri. of 214R1 across 1 & 3	Pri. of RF-800 across 1 & 2	

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA (CONT'D)

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
Special Notes →		⑨	⑦ ⑩	⑧ ⑪	⑨ ⑪	⑨	

⑨ Remove C84, C86, C87 and original width coil from circuit. Connect secondary of replacement width coil to AFC. If picture is out of phase reverse secondary.
⑩ Connect cathode of damper to terminal #8. Connect linearity coil in plate circuit of damper as shown on instruction sheet packed with unit. (Do not use center tap). If insufficient sweep connect a .01 capacitor across terminals #1 and #3.
⑪ If insufficient sweep connect a .01 capacitor across terminals #1 and #3.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA FADA Part No.	Stancor Part No	Merit Part No	Triad Part No	Halldorson Part No.	Thordarson Part No.	NOTES
T8	4.5KΩ	3.3Ω	42.57	A-3877	A-2930	S-3X	21000	TS-24851	

SPEAKER

ITEM No.	RATING SIZE	RATING FIELD	RATING V. C. IMP.	REPLACEMENT DATA FADA Part No	VIKING Part No.	QUAM Part No.	NOTES
SP1	10"	PM	3.3Ω	107.58 107.53 ① 107.57 ①	10J11	10A31	① Used in Models H274T and H276T

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA FADA Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	NOTES
L1	UHF Ant. Coupling Loop	0Ω						
L2	UHF Ant. Coupling Loop	0Ω						
L3	UHF RF Coupling	0Ω						
L4	Fil. Choke	0Ω						
L5	UHF Osc. Tank Coil	0Ω						
L6	UHF Osc. Tank Shunt Coil	0Ω						
L7	UHF Osc. Coil	0Ω	CT					
L8	Harmonic Osc.Coupling	0Ω						
L9	Osc. Doubler Coupling	0Ω						
L10	RF Choke	.1Ω						
L11	UHF IF Output Coil	0Ω	0Ω					
L12A	VHF Ant. RF, Mixer Grid & Osc. Coils	0Ω						
B	UHF 44MC IF Strip	0Ω						Used in UHF position only
L13	Neutr.Coil	0Ω						
L14	Fil. Choke							
L15	Feedback Coil	0Ω						
L16	RF Choke	0Ω						
L17	Conv.Plate	.1Ω	0Ω					
L18	1st.Video IF	0Ω	.1Ω	37.276	17-4531 *		6234	
L19	2nd.Video IF	.2Ω	.2Ω	37.277	17-4531 †		6232	Includes trap
L20	Fil. Choke	0Ω		37.89	19-3001	TV-189	6175	.6 Microhenry
L21	3rd.Video IF	.2Ω	.2Ω	37.278			6233	Includes trap
L22	Fil. Choke	0Ω		37.89	19-3001	TV-189	6175	.6 Microhenry
L23	4th.Video IF	.2Ω	.2Ω	37.279	17-4531 *		6234	
L24	Series Peaking Coil	5Ω		37.234	19-3125		6153	130 Microhenries
L25	Shunt Peaking Coil	18Ω		37.235	19-3080	TV-188	4650	600 Microhenries
L26	Series Peaking Coil	8Ω		37.236	19-3180 ■	TV-184 ■	6180 ■	190 Microhenries, wound on 18KΩ resistor
L27	Shunt Peaking Coil	10Ω		37.237	19-3250	TV-185	6181	245 Microhenries
L28	Sound IF	1.9Ω	1.8Ω	37.252	16-3445 †	TV-113	6203	
L29	Ratio Det.	5.5Ω	1.85CT	37.253	17-3497	TV-115	6205	Tertiary winding-.6Ω
L30	Horiz.Osc.	50Ω		37.233	19-1576	TV-183	6210	

* Detune trap and drill mounting holes.
† Drill mounting holes.
■ Parallel with 18KΩ resistor

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ᶜ/ₛ)	REPLACEMENT DATA FADA Part No.	Stancor Part No.	Merit Part No.	Triad Part No.	Halldorson Part No.	Thordarson Part No.
L31	.290A	80Ω	1.5 Hy.	42.56	C-2326①	C-2996 ①	C-17X ①	CS037 ①	T-26C44①

① Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

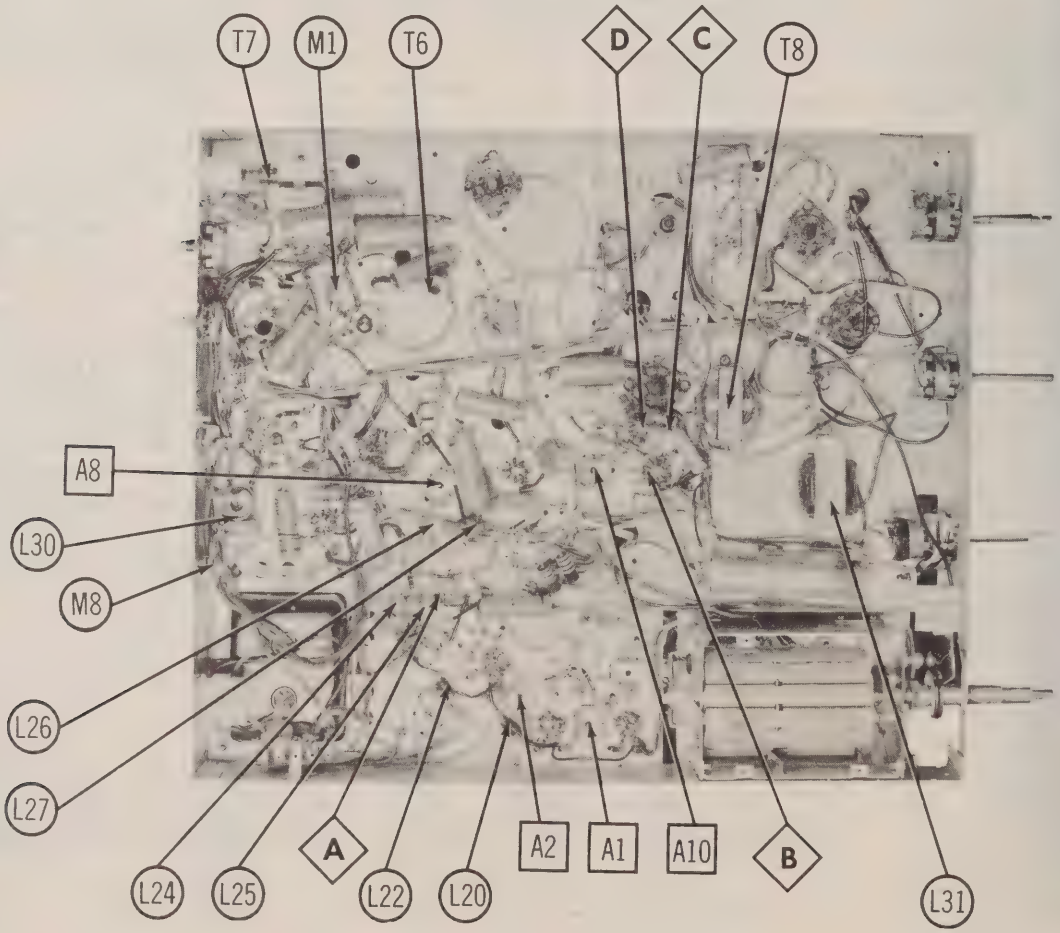
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FADA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG P/T	1/4A 250V			318.250 (3AG P/T - 1/4A)		GJV 1/4	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		FADA PART No.	SYLVANIA PART No.	FEDERAL PART No.	
M2	1N82		1N82 or 1N82A		UHF Mixer
M3	G7B		1N109		Harmonic Generator

MISCELLANEOUS

ITEM No.	PART NAME	FADA PART No.	NOTES
M4	Dial Light		#47 Bayonet
M5	Tuner	42-79	UHF
M6	Tuner		VHF
M7	Switch		UHF/VHF Change-over
M8	Switch		Area Selector (AGC) Not used on Models H276T, H442C
M9	Focus Magnet	112.38	Includes centering device
M10	Ion Trap	112.23	
B2	Trimmer Cap.	132.18	Horiz. Drive (25-280MMF)
	Cabinet	C97.493	Model 274T
	Cabinet	B-97.493	Model H276T
	Cabinet	97.521	Models H442C & H542C
	Knob	142.94	Outside
	Knob	142.93	Inside
	Knob	142.103	Channel Selector
	Knob	142.98	Fine tuning
	Knob	142.95	Brightness
	UHF Dial	142.97	
	Safety Glass	92.560	Models H274T & H276T
	Safety Glass	92.573	Models H442C & H542C



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

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POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1.
If filaments light, substitute V21 and V22. Check B+ filter and decoupling network components.

SMALL AND/OR DIM PICTURE

Substitute V21 and V22. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V17, V18, V19 and V20. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check C85, C89, C90, C91, R88, T3, R90, R91, T5A and other associated circuit components.	Check R80, R81, R83, R85, C81, C83 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V17, V18, V19, V20, V21 and V22. Check picture tube. Proceed as outlined under Loss of High Voltage.

BLOOMING

Check by substitution V18, V19, V20, V21 and V22. Check C85, C91, R88, R90, R91, T3, T5A, picture tube and other associated components.

GENERAL

RASTER – SOUND – NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER – PICTURE – NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER – NO PICTURE – NO SOUND

Check V2, V3, V4, V5, V6, V7 and V8. Check tuner, video IF and video amplifier components. In case of UHF, check V1 and associated components.

NO RASTER – NO SOUND

Follow procedure outlined under "Dead Set".

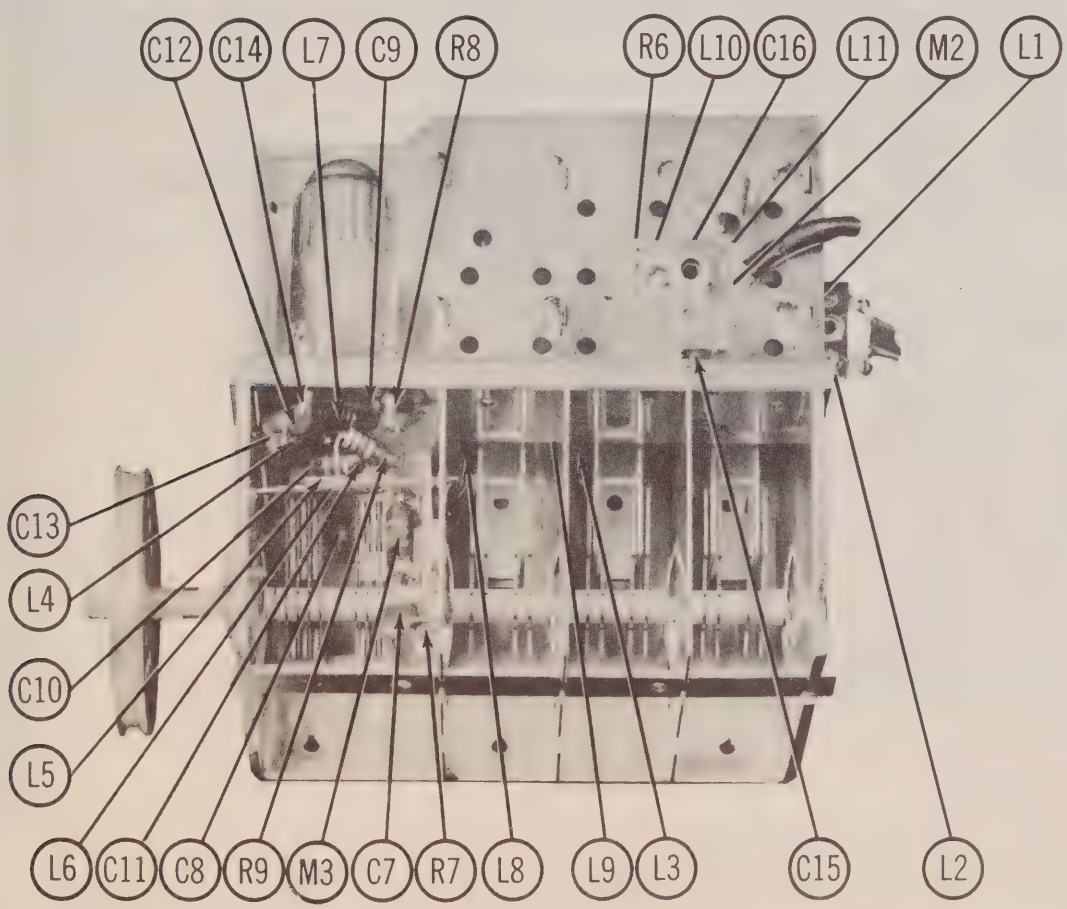
KEYSTONE EFFECT

Check T5, C92, R73, R74 and R75.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



UHF TUNER

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

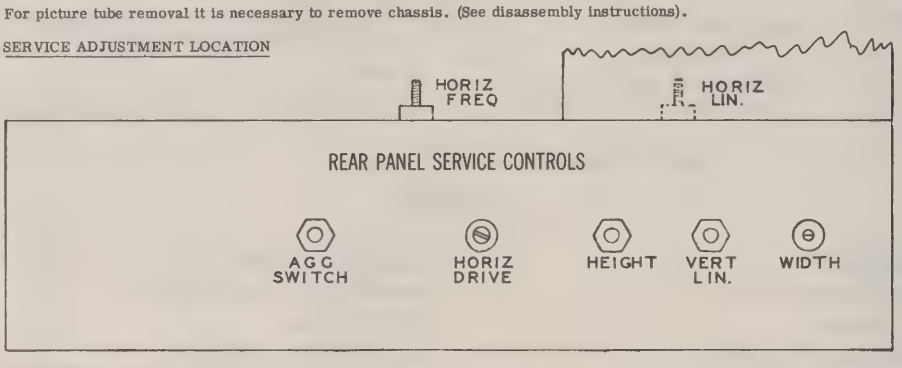
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove two phillip-head wood screws holding wood strips at the sides of the safety glass. Remove wood strips (If wood strips sticks, insert a large wood screw in the top hole of each molding strip and turn until it catches hold. Pull on this screw to remove strip). Remove safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (L30) until, picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

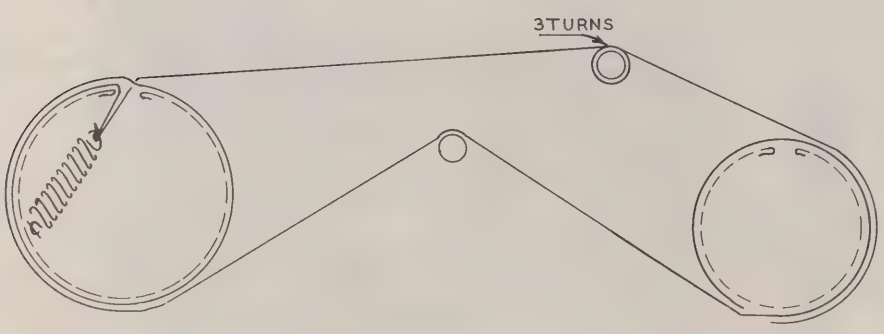
To eliminate sound IF detector buzz, adjust the ratio detector secondary (L29) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for horizontal sweep protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.



UHF DRIVE CORD STRINGING

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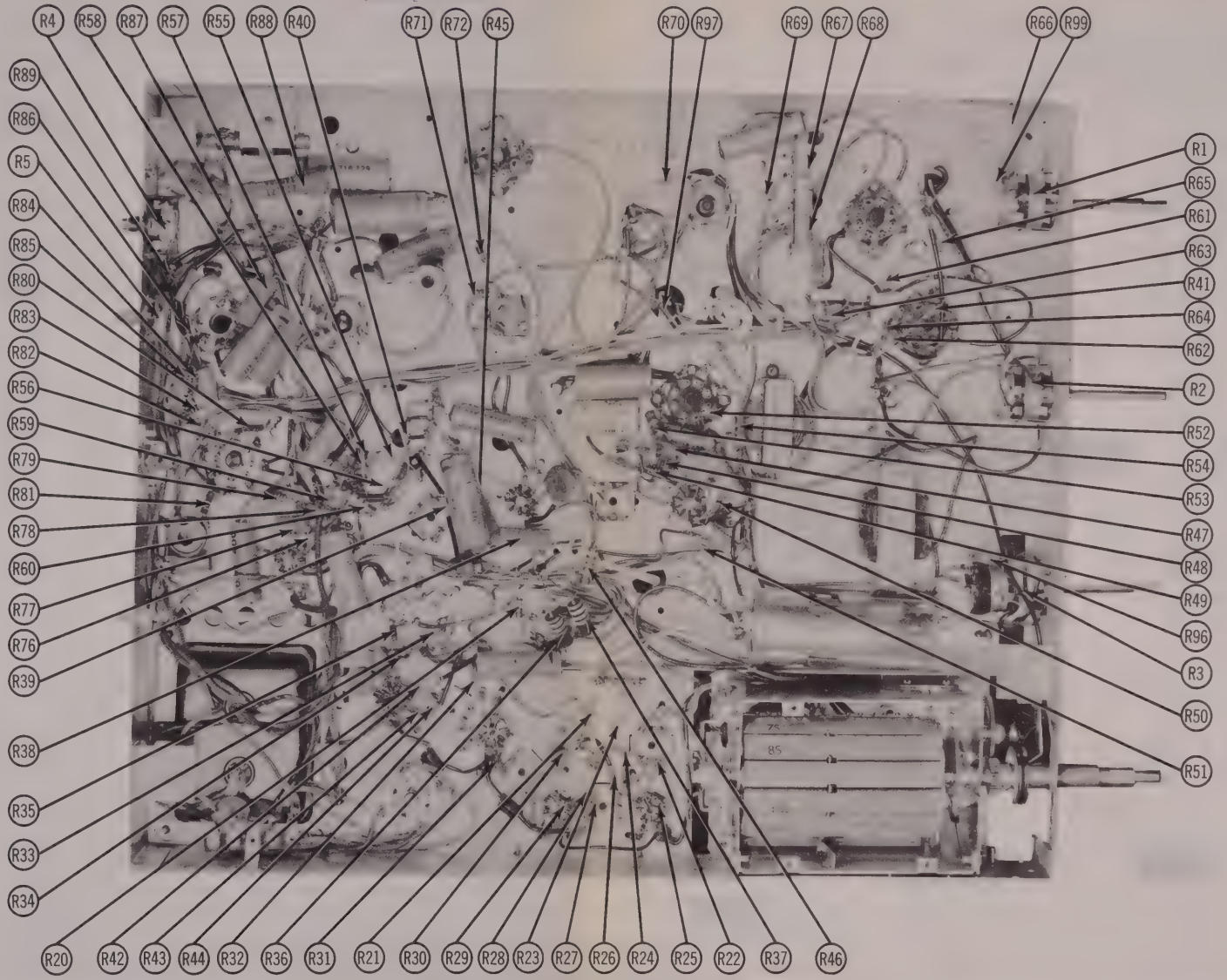

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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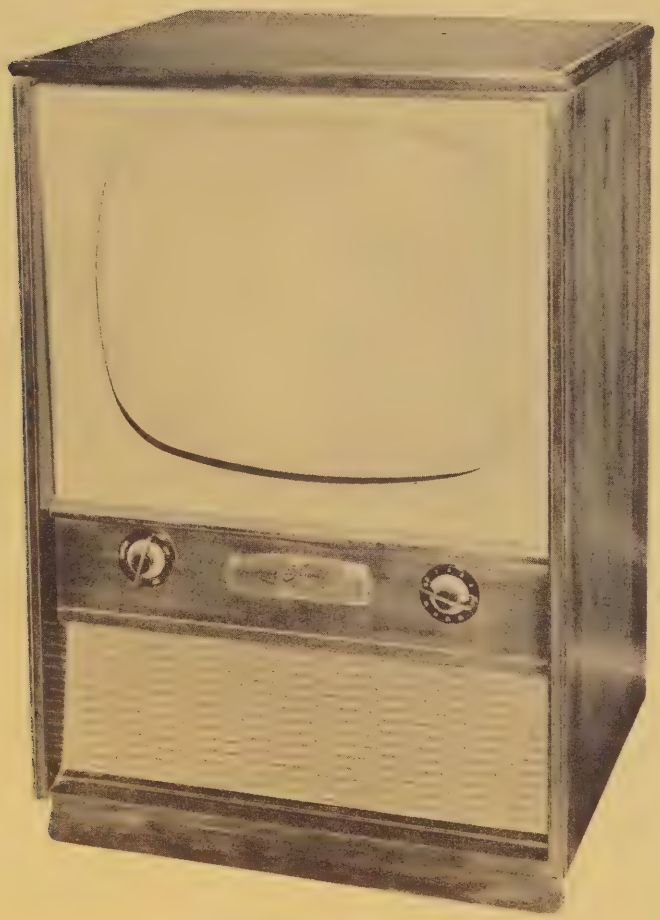

MODEL A24C

MIRRORTONE
MODEL A24C (Ch. 9049, 9051)

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MIRRORTONE
MODEL A24C (Ch. 9049, 9051)

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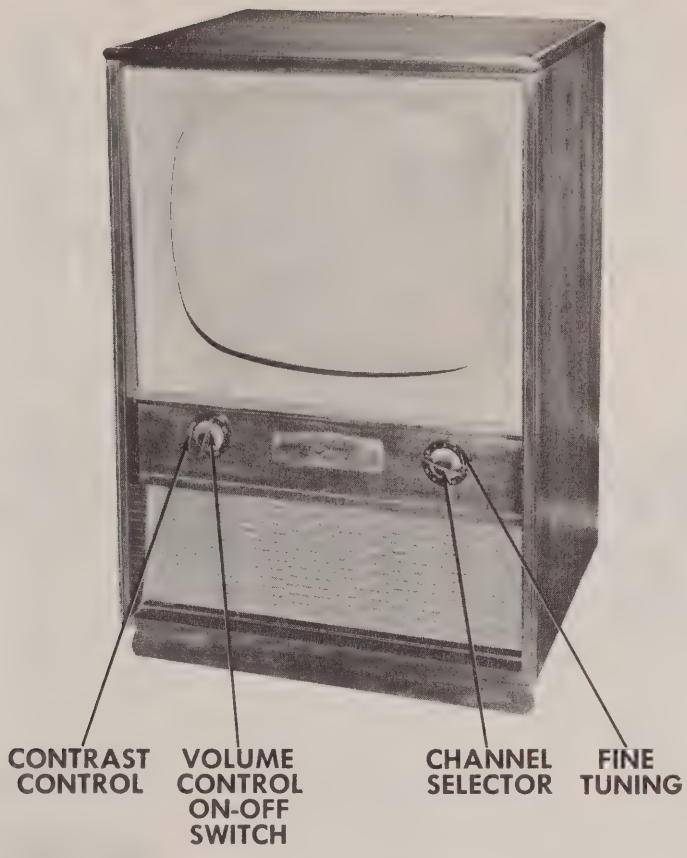

MIRRORTONE MODEL A24C (Ch. 9051)

TRADE NAME	Mirrortone Model A24C (Ch. 9049, 9051)
MANUFACTURER	John Meck Industries, Plymouth, Indiana
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 volts AC-60 cycle
RATING	2.18 Amp. @ 117 volts AC
TUNING RANGE-	Channels 2 thru 13, Video IF 26.1MC, Sound IF 21.6MC (Intercarrier)

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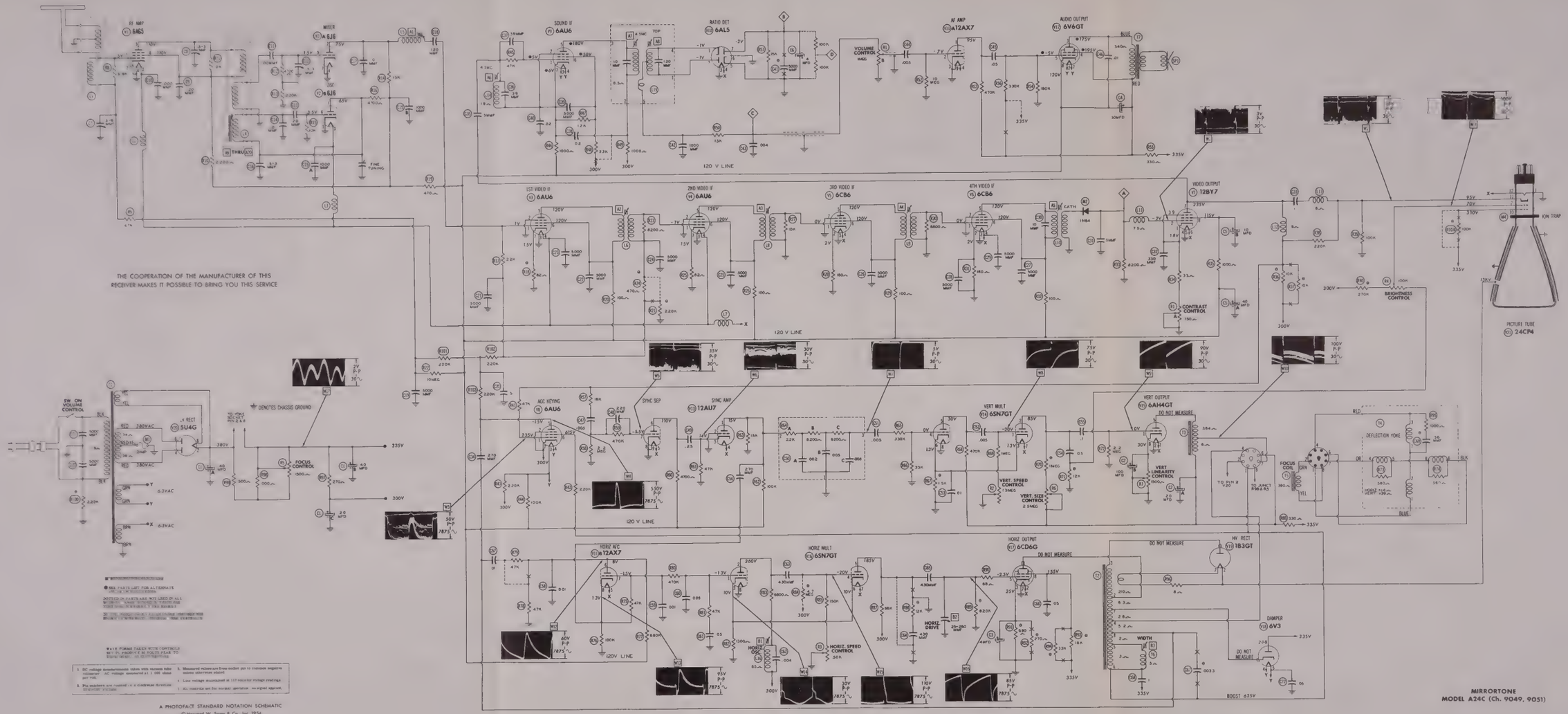
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
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MODEL A24C (Ch. 9049, 9051)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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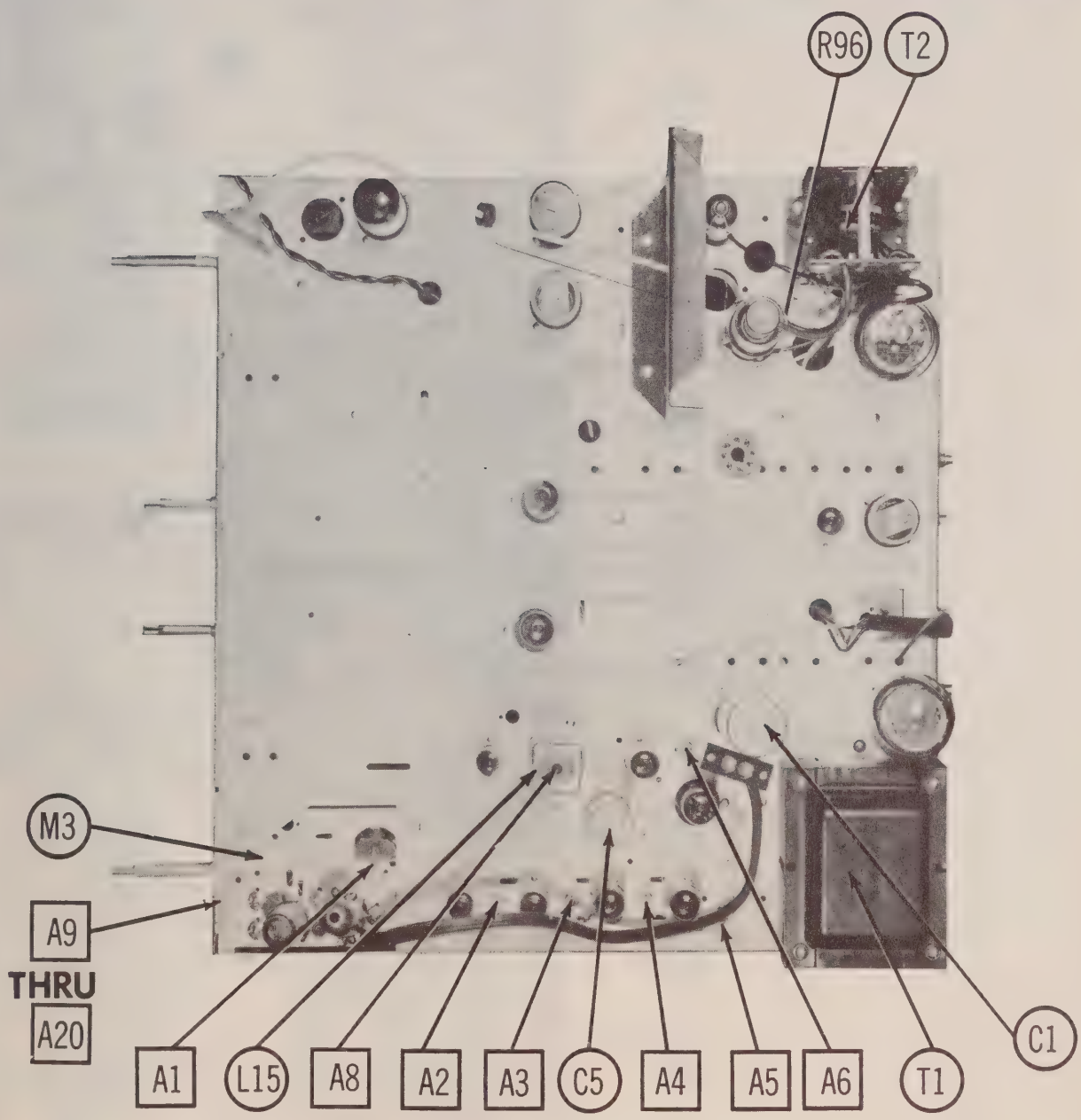

CHASSIS TOP VIEW

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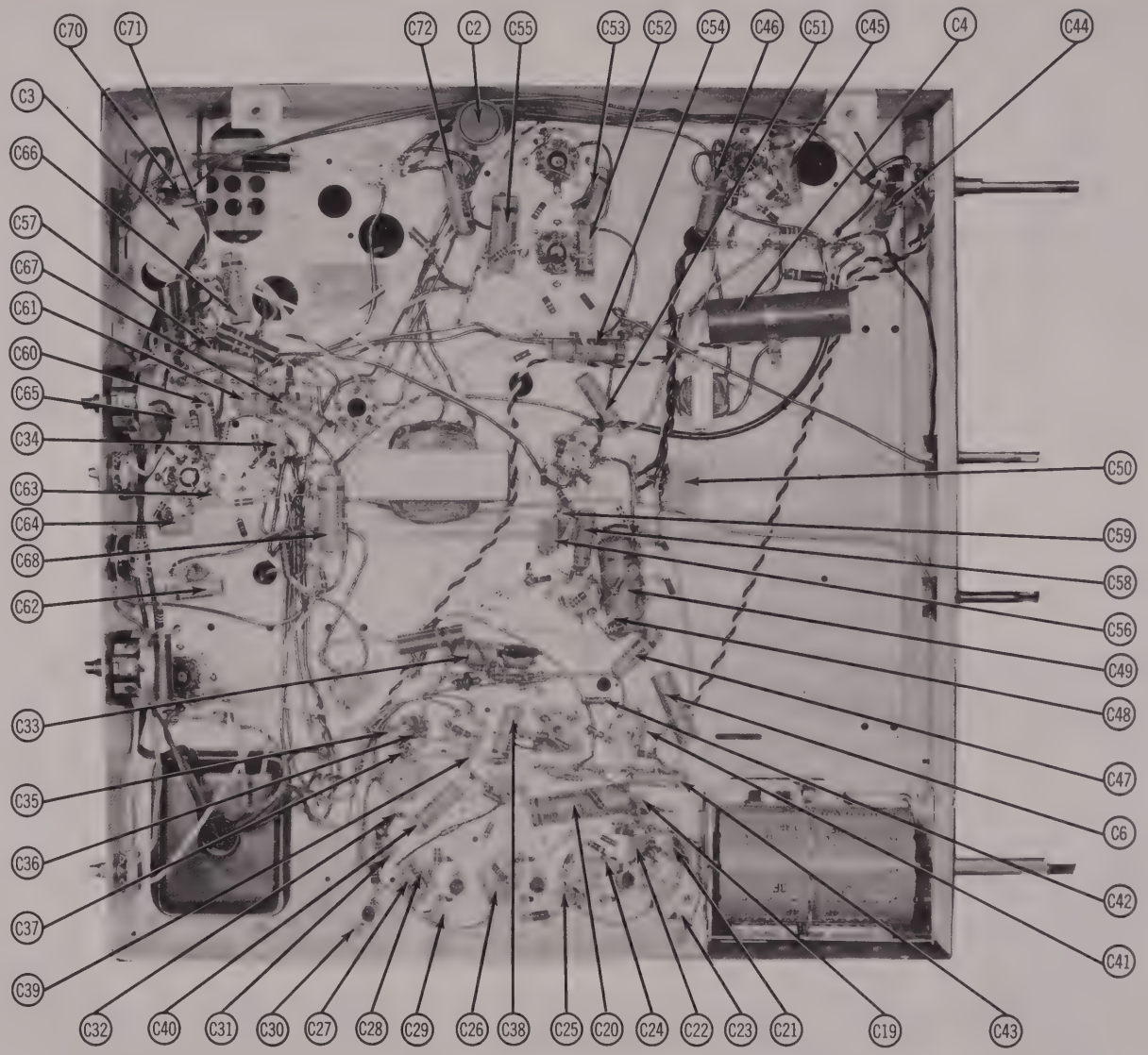
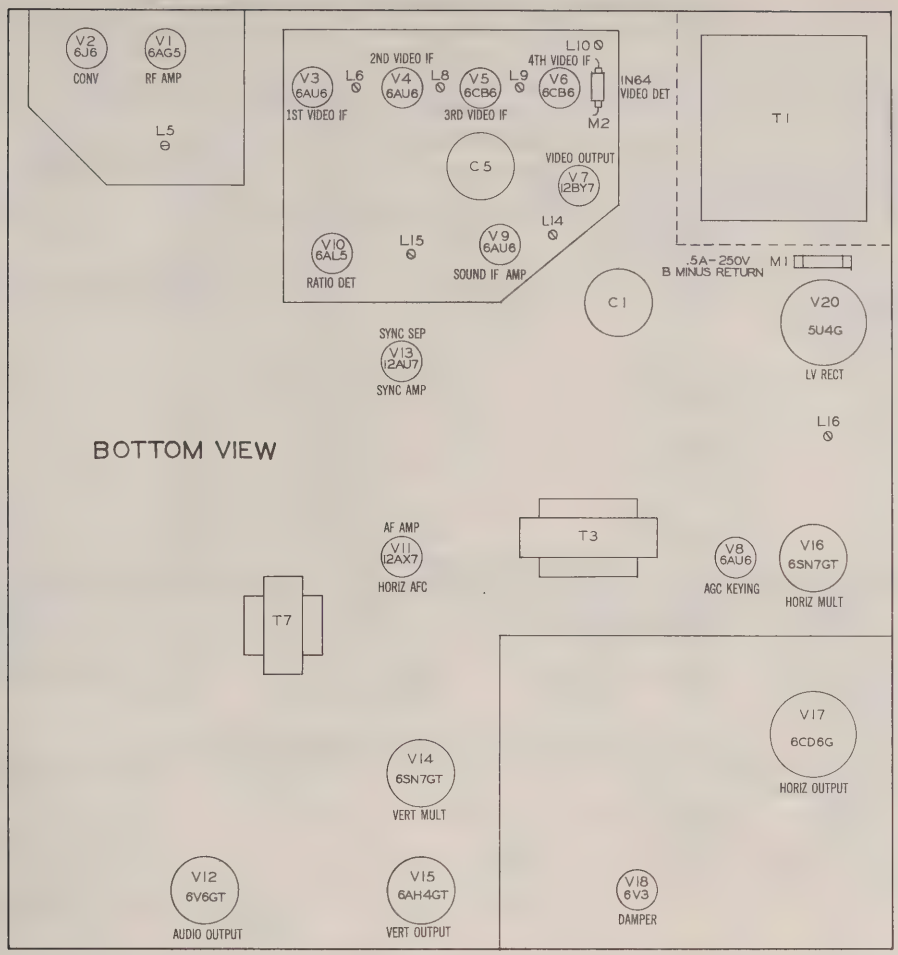


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V20, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V7, V12
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V21
Has pic, no sound - V9, V10, V11, V12
Overloaded picture - V8

SYNC FAILURE
No vert. sync - V13, V14
No horiz. sync - V11, V13, V16
No vert. or horiz. sync - V13

SWEEP FAILURE
No raster, has sound - V16, V17, V18, V19, V21
No vertical deflection - V14, V15
Poor vert. linearity or foldover - V14, V15
Poor horiz. linearity or foldover - V16, V17, V18
Narrow picture - V16, V17, V18, V19, V20
Vert. off freq. - V13, V14
Horiz. off freq. - V11, V13, V16

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V16) to disable the high voltage.

VIDEO IF ALIGNMENT

Individual receivers may employ one of two variations in the video IF strip. The first may be identified by the values of grid resistors (R27 & R30) of the last two video IF amplifier stages, both being 6800Ω. Alignment frequencies for this variation will be indicated by an asterisk(*).
In the other variation R27 is 10KΩ while R30 remains 6800Ω. Alignment frequencies for this second variation will appear in the tables unmarked.
Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C20. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.8MC *25.9MC	Any	DC probe thru 100KΩ to point Ⓐ. Common to chassis.	A1	Attenuate generator output to maintain not more than 1 volt on VTVM. Adjust for maximum deflection.
2.	"	"	24.4MC *24.3MC	"	"	A2	"
3.	"	"	22.8MC *23.1MC	"	"	A3	"
4.	"	"	23.2MC *22.9MC	"	"	A4	"
5.	"	"	25.4MC *25.7MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.6MC 22.7MC 26.1MC	Any	Vert. Amp. thru 100KΩ to point Ⓐ. Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A1 thru A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓑ to chassis. The junction of these two resistors is alignment point Ⓓ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A6, A7	Adjust for maximum deflection. Attenuate generator output to maintain less than 5 volts on VTVM.
8.	"	"	"	"	DC probe to point Ⓒ. Common to point Ⓓ.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓑ. Low side to chassis.	A6, A7	Disconnect stabilizing capacitor C6. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
8.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A8	Reconnect stabilizing capacitor C6. Adjust so that 4.5MC occurs at center of cross-over lines as in Fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

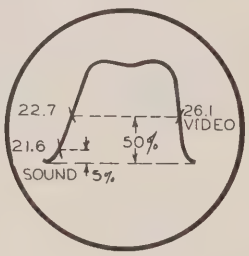

FIG. 1

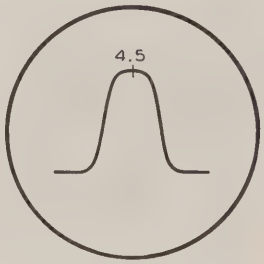

FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Leave the bias battery connected as under "Video IF Alignment".
The channel oscillator adjustment screws are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 100KΩ to point (A). Low side to chassis.	A9	Adjust to place video marker at 50% as in Fig. 4. Sound marker should not exceed 5%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A10	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A11	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A12	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A13	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A14	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A15	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A16	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A17	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A18	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A19	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A20	

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RF AND MIXER ALIGNMENT

The RF and mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

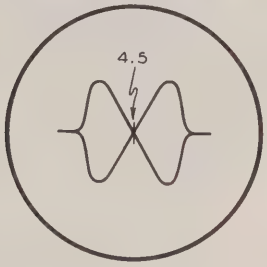


FIG. 3

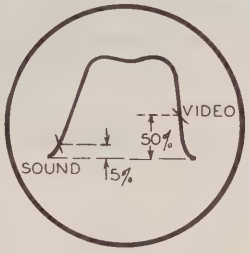
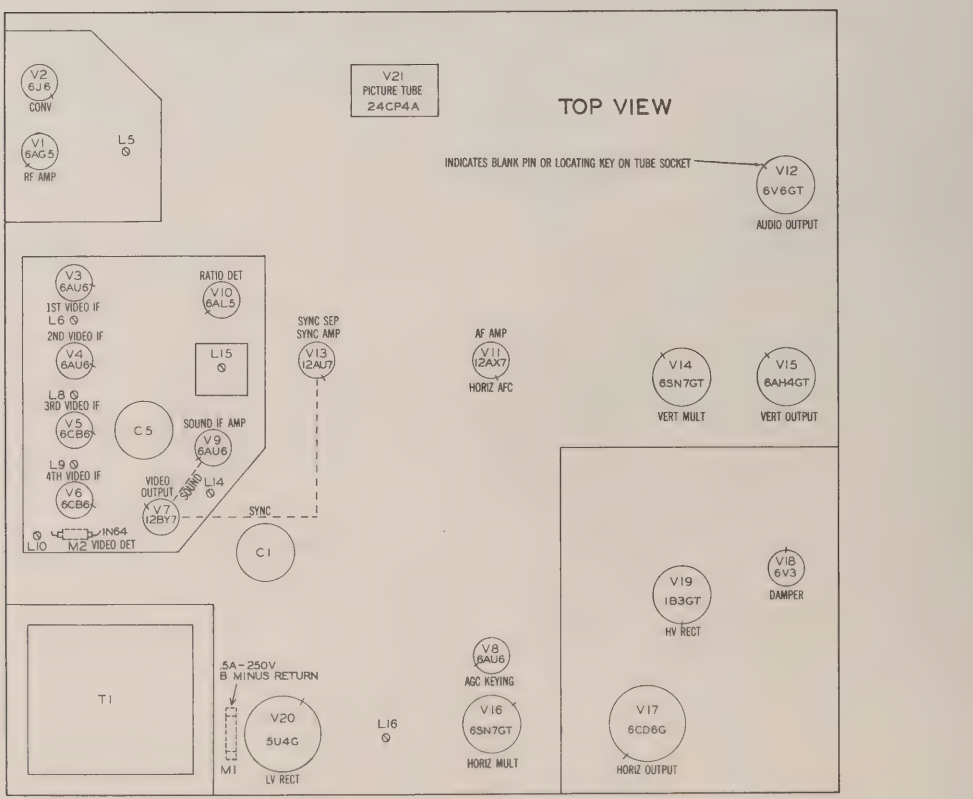


FIG. 4

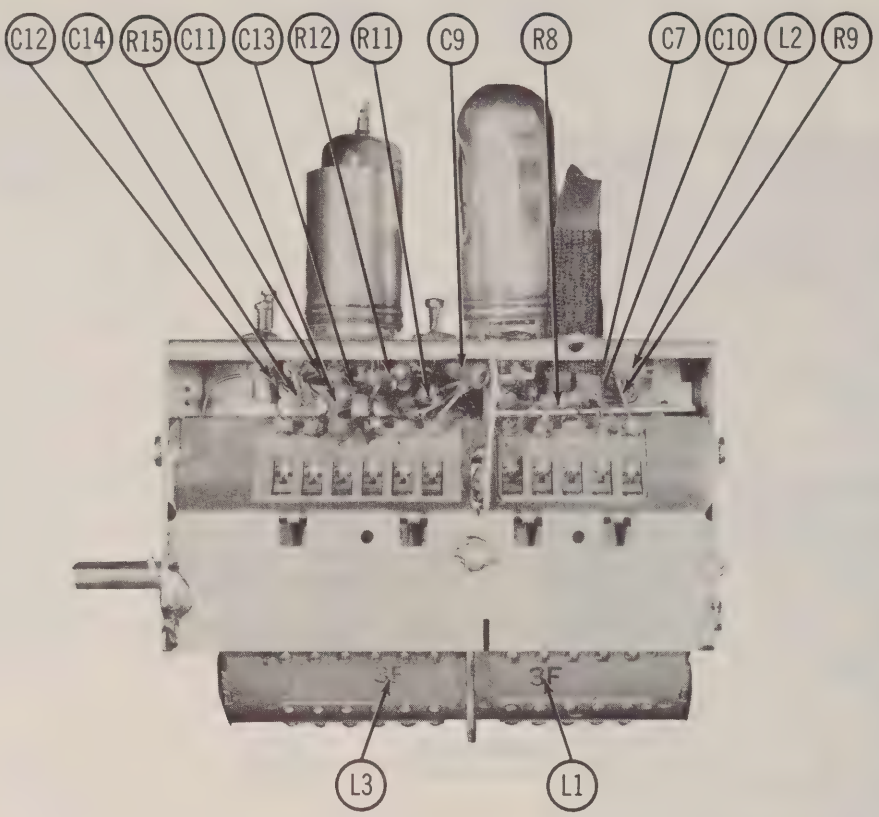
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	710KΩ	0Ω	.1Ω	0Ω	♦ 2. 7KΩ	♦ 2. 7KΩ	0Ω		
V 2	6 J6	♦ 5. 2KΩ	♦ 15. 5KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6 AU6	240KΩ	0Ω	0Ω	.1Ω	♦ 100Ω	♦ 100Ω	82Ω		
V 4	6AU6	220KΩ	0Ω	0Ω	.1Ω	♦ 100Ω	♦ 100Ω	82Ω		
V 5	6 CB6	.1Ω	180Ω	0Ω	.1Ω	♦ 100Ω	♦ 100Ω	0Ω		
V 6	6CB6	.1Ω	180Ω	0Ω	.1Ω	♦ 100Ω	♦ 100Ω	0Ω		
V 7	12BY7	160Ω	8. 2KΩ	160Ω	0Ω	0Ω	.1Ω	† 6. 8KΩ	♦ 1KΩ	160Ω
V 8	6AU6	† 52KΩ	400Ω	♦ 100KΩ	♦ 100KΩ	660KΩ	▲ 220KΩ	400Ω		
V 9	6 AU6	♦ 48KΩ	♦ 1KΩ	♦ 100KΩ	♦ 100KΩ	† 2. 7KΩ	† 35KΩ	♦ 1KΩ		
V 10	6 AL5	1 Meg	1 Meg	0Ω	.1Ω	0Ω	INF	15KΩ		
V 11	12AX7	† 470KΩ	10 Meg	0Ω	.1Ω	.1Ω	47KΩ	150KΩ	100KΩ	0Ω
V 12	6 V6GT	INF	♦ 100KΩ	† 870Ω	† 530Ω	120KΩ	INF	† 100KΩ	45KΩ	
V 13	12AU7	15KΩ	0Ω	47KΩ	.1Ω	.1Ω	♦ 4, 7KΩ	2, 7 Meg	0Ω	0Ω
V 14	6SN7GT	1. 9 Meg	† 2 Meg	1. 5KΩ	33KΩ	† 470KΩ	1. 5 KΩ	.1Ω	0Ω	
V 15	6 AH4GT	2. 2 Meg	0Ω	2. 2 Meg	INF	† 820Ω	INF	.1Ω	1. 3KΩ	
V 16	6SN7GT	620KΩ	† 8. 5KΩ	1. 3KΩ	210KΩ	† 70KΩ	1. 3KΩ	.1Ω	0Ω	
V 17	6CD6G	94KΩ	.1Ω	200Ω	47KΩ	820KΩ	INF	0Ω	† 13KΩ	TOP CAP ▲ 8. 3Ω
V 18	6 V3	INF	† 220Ω	INF	♦ 100KΩ	♦ 100KΩ	INF	† 220Ω	INF	† 220Ω — TOP CAP INF
V 19	1 B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ▲ 220Ω
V 20	5U4G	INF	350KΩ	INF	38Ω	INF	40Ω	† 110KΩ	350KΩ	
V 21	24CP4	0Ω	† 120KΩ	PIN 10 † 100KΩ	PIN 11 † 110KΩ	PIN 12 .1Ω				

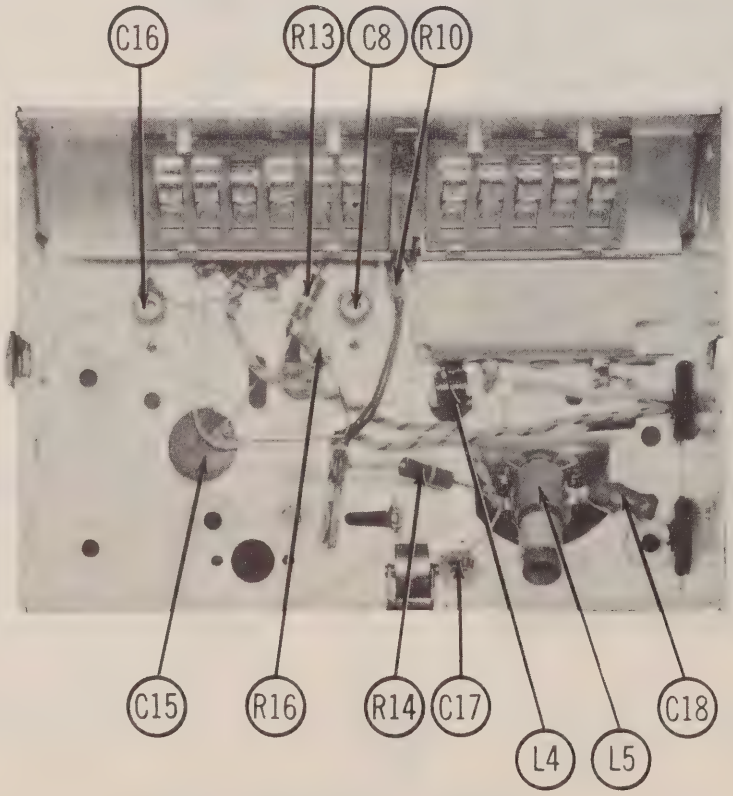
♦ MEASURED FROM 120V lines
† MEASURED FROM PIN 2 OF V20
▲ MEASURED FROM TOP CAP OF V18



TUBE PLACEMENT CHART

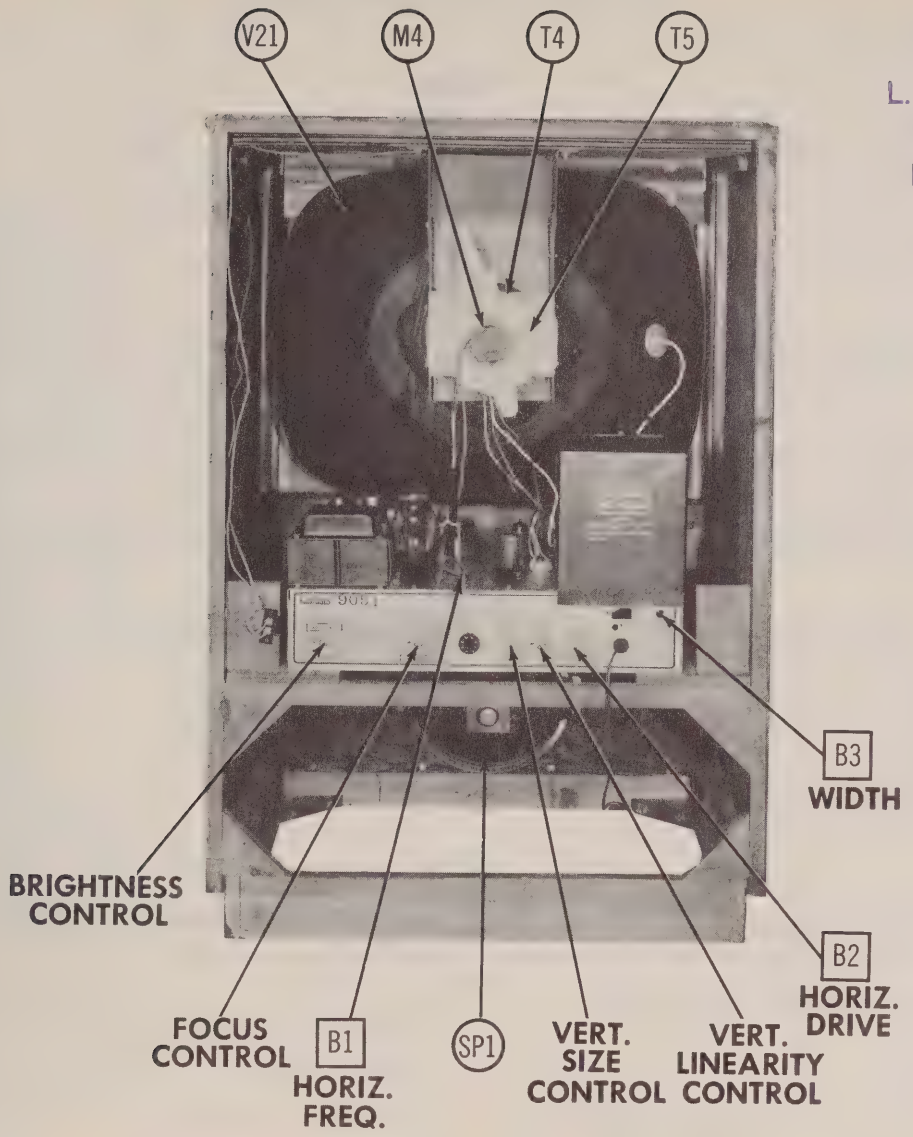


RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3921 MEADE ST.
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to its mid-range position and adjust the horizontal oscillator slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined " Loss of High Voltage".

INSUFFICIENT SWEEP

Adjust B2 and B3. Check by substitution V16, V17 and V18. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check T2, T6, C66, C72, C68, R92, R93, R94 and other associated components.	Check R90, R89, R86, C64, C65, C3 and other associated circuit components.

DRIVE LINES

Adjust B2 and B3. Substitute V17 and V18. Check T2, C65, C64 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V16, V17 and V18. Check components associated with the Horizontal output and damper stages, especially T2 and T4A for failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V16, V17 and V18. Check C60, C61, R81 and other associated components.

XMAS TREE EFFECT

Check by substitution V16, V17 and V18. Check L16, C60, C61, R81, C63, C62, R83 and other associated components for failure or change of value.

VERTICAL

LOSS OF SWEEP

Check by substitution V14 and V15. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check T3, T4B, C2B, C2A, R7 and other associated components.	Check C55, C52, R70, R6, R68 and other associated circuit chmponents.

INSUFFICIENT SWEEP

Check the height and vertical linearity controls for proper adjustments. Follow procedure outlined under " Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V14 and V15. Check T3, T4B, R6, R70, C2A, C55 and other associated components.

COMPRESSED AT TOP

Check by substitution V14 and V15. Check R7, R72, C2B and other associated circuit components.

FOLDS

Check by substitution V14 and V15. Check components associated with V14 and V15 for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Substitute V13. Check C47, C48, C49, R61, R60, R62, and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V14. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check components associated with V14., especially C51, R65, R66, R2.	Check vertical integrator network and other associated components. Check video IF alignment for overloading.

LOSS HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V11 and V16. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check R3, L16, C63, R85, and other associated components.	Check components associated with AFC network.

HORIZONTAL BENDING

Check by substitution V13, V11 and V16. Check horizontal AFC network for component failure or change of value.

VIDEO

LOSS OF VIDEO

Substitute V7. Check components associated w. .. V7. Check picture tube.

SOUND BARS (4.5MC BEAT)

Adjust tuner finetuning for best picture and sound. Check adjustment A6. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check video detector crystal network. Check picture tube and other associated circuit components.

NEGATIVE PICTURE

Substitue V7. Check video detector assembly. Check picture tube. Check A G C. network for proper operation.

SMEAR

Substitute V7. Check L12, L13, L11, C33 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5, V6 and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10, V11 and V12. Check stages V11 and V12 using audio signal generator. Apply audio signal across R52.

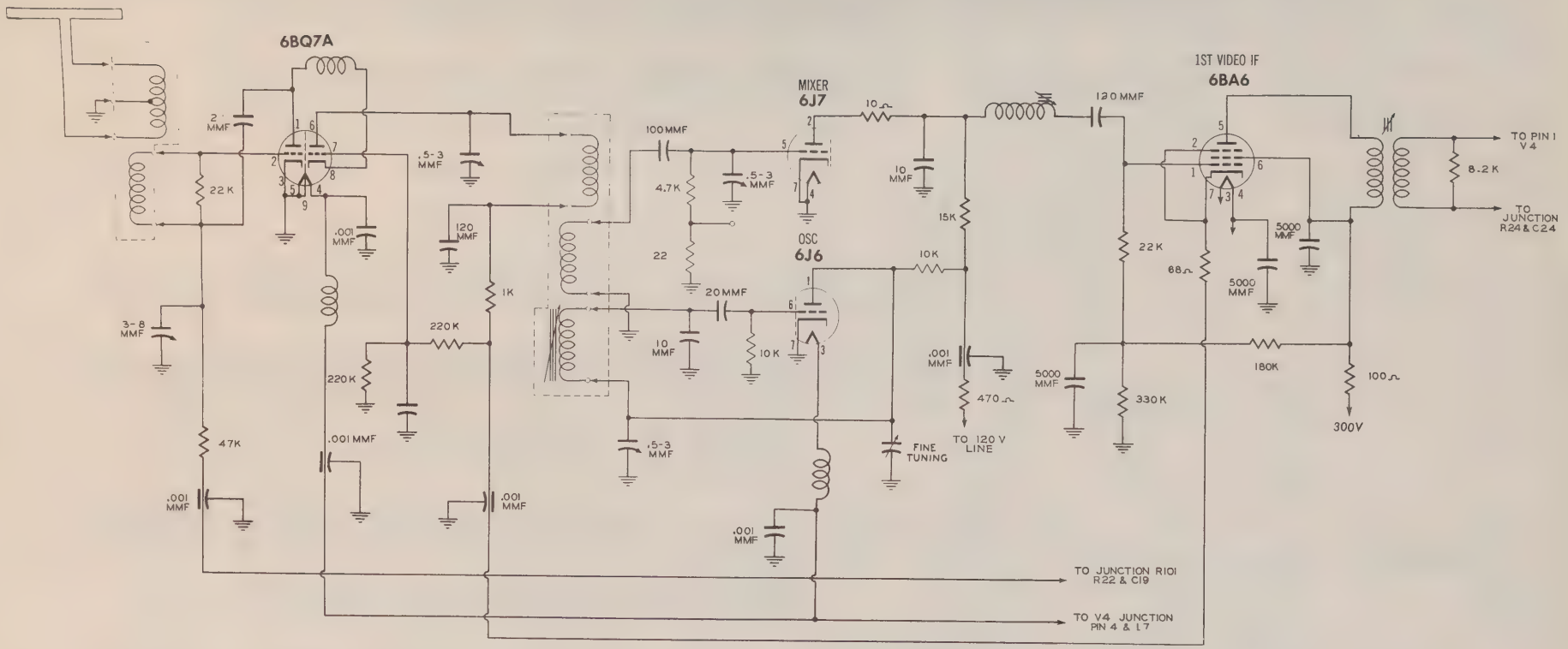
If Satisfactory	If Unsatisfactory
Check components associated with V9 and V10. Check audio IF alignment.	Check C45, C46, R53, T7, speaker and other associated components.

BUZZ

Adjust tuner fine tunrng for best picture and sound. Adjust A8 for minimum buzz. Check C6 and other associated components.

DISTORTED

Follow procedure outlined under "Weak or No Sound".



VHF TUNER, PART NO. TT-10014, AND 1ST VIDEO IF USED ON CHASSIS 9049

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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3921 [illegible]
DENVER, COLORADO

ALTERNATE TUNER SCHEMATIC

MODEL A24C (Ch. 9049, 9051)

MIRRORTONE

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No	USE	REPLACEMENT DATA: MIRRORTONE PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	4th Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	1BY7	1BY7	9BF	
V8	AGC Keying	6AU6	6AU6	7BK	
V9	Sound IF Amplifier	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier Horiz. AFC	12AX7	12AX7	9A	
V12	Audio Output	6V6GT	6V6GT	7S	
V13	Sync Separator-Sync Amplifier	13AU7	13AU7	9A	
V14	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V15	Vert. Output	6AH4GT	6AH4GT	8EL	
V16	Horiz. Mult	6SN7GT	6SN7GT	8BD	
V17	Horiz. Output	6CD6G	6CD6G	5BT	
V18	Damper	6V3	6V3	5BD	
V19	HV Rectifier	1B3GT	1B3GT	3C	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: MIRRORTONE PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V21	24CP4	24CP4A ① 24TP4	24CP4A ①	24CP4 24CP4A ①		12N 12N 12N	① Aluminized

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MIRRORTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	±40	450	CLC-10075	*AFE2-57		C155		FP236	TVL-3786	
B	±40	450		*PRS450/30				TC75		
C	±20	450								
C2A	20	450	CLC-10050	*PRS450/20		BR2645		TC75	TVA-1709	Red
B	100	25		*PRS25/100		LBR2551		TC2501	TVA-1207	Yellow
C3	4	50	CLA-10037A	PRS150/4		BR415		TC30	TVA-1402	
C4	50	350	CLA-10067C	PRS450/50		BR5035		TC68	TVA-1713	
C5A	±40	350	CLC-10074	AFB5-38		C022		FP330.7	TVL-2817	
B	±10	350								
C6	4	50	CLA-10027A	PRS150/4		BR415		TC30	TVA-1402	
C7	3-8				829-10		3115-01-OR5	CT565A		
C8	.5-3				829-3				5GA-T12	
C9	120			SU120	D6-121	TP35	GP2K-121	UC-5312		
C10	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C11	100			SU100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C12	.5-3				829-3		3115-01-OR5	CT565A		
C13	20			SU20NP0	TCZ-20	TZ13	NP0K-200	ZT-541	5TCC-Q2	
C14	10			SU10N750	TCN-10	N01S	N750K-100	NT-541	5TCU-Q1	
C15A	1000			BPD-2X001	DD2-102	DK069	S12-001	DCD-521	5HK-2D1	
B	1000									
C16	.5-3				829-3		3115-01-OR5	CT565A		
C17	10			SU10NP0	TCZ-10	Z01S	NP0K-100	ZT-541	5TCC-Q1	
C18	120			SU120	D6-121	TP35	GP2K-121	UC-5312	5GA-T12	
C19	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C20	.5	200		P288-5		CUB23P5		PT405	2TM-P5	
C21	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C22	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C23	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C24	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C25	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C26	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C27	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C28	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C29	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C30	10			SU10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C31	5			SU5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C32	330			SU330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C33	.1	600		P588-1	DF-104	CUB6P1		PT601	6TM-P1	
C34	270	500		1469-0003		5R5T27		MC241	MS-33	
C35	5			SU5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C36	39	500		1468-00004	D6-390	5W5Q39	GP1K-390	MC223	1FM-44	
C37	39	500		1468-00004	D6-390	5W5Q39	GP1K-390	MC223	1FM-44	
C38	.02	600		P588-02	DF-203	CUB6S2	81T-02	PT612	6TM-S3	
C39	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C40	.02	600		P588-02	DF-203	CUB6S2	81T-02	PT612	6TM-S2	
C41	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	Note 1
C43	1000			SU1000	D6-102	TP32	GP2L-102	UC-5321	5HK-D1	
C43	.004	400		P588-004	D6-402	CUB6D4	GP2-333-402	PT634	6TM-D4	
C44	.006	600		P588-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C46	.05	600		P588-05	DF-503	CUB6S5		PT615	6TM-S5	
C46	.1	1000		P1088-01		CUB16S1		PT1611	MB-S1	
C47	.005	600		P588-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C48	220			SU220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C49	.35	400		P488-25		CUB4P25		PT4025	4TM-P25	
C50A	.002		*CMX-10012	*PA-110	*PC-100	*11S1TM1	*1405-01	PT623 PT633 PT625	eV-1	
B	.005									
C	.005									
C51	.005	600		P588-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C52	.005	600		P588-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C53	.01	600		P588-01	D6-103	CUB6S1	GP2-333-103	PT615	6TM-S1	
C54	.05	600		P588-05	DF-503	CUB6S5		PT615	6TM-S5	
C55	.1	600		P588-1	DF-104	CUB6P1		PT601	6TM-P1	
C56	270	500		1469-0003		5R5T27		MC241	MS-33	
C57	.01	1000		P1088-01		CUB16S1		PT1611	MB-S1	
C58	.001	800		P488-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MIRRORTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C59	.001	500		P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C60	.005	600		P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C61	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C62	.004	400	CPA-14403B	1464-004		1R5D4		MCE463	MB-24	
C63	430	500				5R5T43				
C64	430	500				5R5T43				
C65	430	500				5R5T43				
C66	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C67	.0033	600		P688-0033	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	Note 1
C68	.1	600		P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C69	55	2000					3KV-560		20GA-Q56	Note 2
C70	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C71	5000		CMX-10002	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C72	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	

Note 1. Not used in chassis 9049.
Note 2. Chassis 9049 use 120MMF in this application.
* Items C50A, C50B, C50C, R64A, R64B, R64C are combined in one unit.

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MIRRORTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	750Ω	½	VCA12140		RTV-445		UP75I-752	Contrast tapped at 375Ω-Panel
B	1 Meg	½					UB16-T254 †	Volume tapped at 250KΩ-Rear
C	Switch						UB-26	Attach to R1B
R2A	1.3 Meg	½	VC12132	Q11-138	A47-2Meg-S	AB-59	U-155	Vert. speed
B	Shaft		Not Req.	Not Req.	KSB-3	AK-4	Not Req.	Attach to R2A
R3A	50KΩ	½	VC-12131E	Q11-123	A47-50K-S	AB-31	U-35	Horiz. Speed
B	Shaft		Not Req.	Not Req.	KSB-3	AK-4	Not Req.	Attach to R3A
R4A	100KΩ	½	VCA-12135	Q11-128	A47-100K-S	AB-40	SU-41	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	1500Ω	4	VC12122		A10-1500	SVP-994	TVF140	Focus - wire wound
B	Shaft		Not Req.		FKS-1/4	Not Req.	Not Req.	Attach to R5A
R6A	2.5Meg	½	VC12121	Q11-239	A47-2.5Meg-S	AB-33	SU-565	Vert. size
B	Shaft		Not Req.	Not Req.	KSB-3	AK-1	Not Req.	Attach to R6A
R7A	1500Ω	4	VC12122		A10-1500	SVP-994	TVF140	Vert. Linearity
B	Shaft		Not Req.		FKS-1/4	Not Req.	Not Req.	Attach to R7A

† Universal replacement (Mallory exact duplicate Part No. UE18S)

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MIRRORTONE PART No.	IRC PART No.	NOTES
R8	3900Ω	½		BTS-3900	
R9	47KΩ	½		BTS-47K	
R10	2200Ω	½		BTS-2200	
R11	10KΩ	½		BTS-10K	
R12	4700Ω	½		BTS-4700	
R13	220KΩ	½		BTS-220K	
R14	15KΩ	½		BTS-15K	
R15	10KΩ	½		BTS-10K	
R16	4700Ω	1		BTS-4700	
R17	22KΩ	½		BTS-22K	
R18	82Ω	½		BTS-82	Note 14
R19	470Ω	½		BTS-470	
R20	100Ω	½		BTS-100	Note 9
R21	220KΩ	½		BTS-220K	Note 10
R22	10 Meg	½		BTS-10 Meg	
R23	8200Ω	½		BTS-8200	Note 4
R24	470Ω	½		BTS-470	Note 15
R25	82Ω	½		BTS-82	
R26	100Ω	½		BTS-100	
R27	10KΩ	½		BTS-10K	
R28	180Ω	½		BTS-180	
R29	100Ω	½		BTS-100	
R30	6800Ω	½		BTS-6800	
R31	180Ω	½		BTS-180	
R32	100Ω	½		BTS-100	
R33	8200Ω	½		BTS-8200	
R34	33Ω	½		BTS-33	
R35	1000Ω	½		BTS-1000	Note 9
R36	10KΩ	2			Note 11
R37	10KΩ	2			Note 8
R38	220KΩ	1		BTS-220K	
R39	100KΩ	1		BTS-100K	
R40	270KΩ	1		BTS-270K	Note 2
R41	47KΩ	1		BTS-47K	
R42	220KΩ	1		BTS-220K	
R43	220KΩ	1		BTS-220K	
R44	100KΩ	1		BTS-100K	
R45	47KΩ	1		BTS-47K	
R46	1000Ω	1		BTS-1000	
R47	12KΩ	1		BTS-12K	
R48	33KΩ	1		BTA-33K	Note 3
R49	1000Ω	1		BTS-1000	
R50	15KΩ	1		BTS-15K	
R51	15KΩ	1		BTS-15K	
R52	10 Meg	1		BTS-10 Meg	
R53	470KΩ	1		BTS-470K	
R54	180KΩ 5%	1		BTS-180K 5%	
R55	330Ω	1		BTA-330	
R56	330KΩ 5%	1		BTS-330K 5%	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MIRRORTONE PART No.	IRC PART No.	NOTES
R57	18KΩ	½		BTS-18K	
R58	2.2 Meg	½		BTS-2.2 Meg	
R59	470KΩ	½		BTS-470K	
R60	4700Ω	½		BTS-4700	
R61	47KΩ	½		BTS-47K	
R62	100KΩ	½		BTS-100K	
R63	15KΩ	½		BTS-15K	
R64A	22KΩ	½		BTS-22K	
B	8200Ω	1	* CMX-10012	BTS-8200	
C	8200Ω	1		BTS-8200	
R65	330KΩ	½		BTS-330K	
R66	33KΩ	½		BTS-33K	
R67	1500Ω	½		BTS-1500	Note 9
R68	470KΩ	½		BTS-470K	
R69	1 Meg	½		BTS-1 Meg	
R70	1 Meg	½		BTS-1 Meg	Note 4
R71	12KΩ	½		BTS-12K	Note 5
R72	2.2 Meg	½		BTS-2.2 Meg	
R73	560Ω	½		BTS-560	
R74	560Ω	½		BTS-560	
R75	47KΩ	½		BTS-47K	
R76	100KΩ	½		BTS-100K	
R77	680KΩ	½		BTS-680K	
R78	47KΩ	½		BTS-47K	
R79	47KΩ	½		BTS-47K	
R80	470KΩ	½		BTS-470K	
R81	47K	½		BTS-47K	
R82	13000 5%	½		BTS-1300 5%	Note 9
R83	6800Ω	½		BTS-6800	Note 11
R84	4.75Meg	½		BTS-4.7Meg	Note 8
R85	150KΩ	½		BTS-150K	
R86	12KΩ	½		BTS-12K	Note 12
R87	68KΩ	½		BTS-68K	
R88	330Ω	1		BTA-330	
R89	820KΩ	½		BTS-820K	Note 6
R90	68Ω	½		BTS-68	
R91	680Ω	2		BTB-680	Note 7
R92	270Ω	2			Note 7
R93	18KΩ	2		BTB-18K	Note 13
R94	33KΩ	1		BTA-33K	Note 13
R95	1000Ω	1		BTS-1000	
R96	8Ω	3			
R97	27Ω	3			Note 7
R98	1000Ω	2		BTB-1000	
R99	1500Ω	1		BTA-1500	
R100	220KΩ	1		BTA-220K	Note 8
R101	220KΩ	½		BTS-220K	
R102	220KΩ	½		BTS-220K	
R103	220KΩ	½		BTS-220K	
R104	100KΩ	½		BTS-100K	Note 8

* Items R64A, R64B, R64C, C50A, C50B, C50C are combined in one unit.
Note 1. Some models may use a single 5000Ω 4 watt resistor in this application.
Note 2. Some models may use a 330KΩ resistor in this application.
Note 3. Some models may use a 39KΩ resistor in this application.
Note 4. Some models may use a 820KΩ resistor in this application.
Note 5. Some models may use a 10KΩ resistor in this application.
Note 6. Some models may use a 1 Meg resistor in this application.
Note. 7. Some models may use a single 200Ω 2 watt resistor in this application.
Note 8. Not used in all models.
Note 9. Some models may use a 1000Ω resistor in this application.
Note 10. Some models may use a 100K resistor in this application.
Note 11. Some models may use a 5600Ω resistor in this application.
Note 12. Some models may use a 8200Ω resistor in this application.
Note 13. Some models may use a single 18KΩ 2 watt resistor in this application.
Note 14. Some models may use a 68Ω resistor in this application.
Note 15. Used in chassis No. 9051.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	REPLACEMENT DATA: MIRRORTONE PART No.	Stancor PART No.	Merit PART No	Triad PART No	RCA TYPE No.	Halldorson PART No	Thordarson PART No
T1	117VAC ⑨2.18A	750VCT .230ADC	5VAC ⑨3A	TPC-10013C TPC-10011 ①	P-8169 ⑦	P-3053 ③ ④ ⑤	R-37BC ⑥		P9731 ②	
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC ⑨2.64A	6.3VAC ⑨8.2A								

① Alternate power transformer.
② Parallel and phase 6.3V ⑨ 7A and 6.3V ⑨ 1.2A windings for Sec. #4.
③ Use high voltage tape on Sec. #1 only.
④ Parallel and phase 6.3V ⑨ 7A windings for Sec. 4.
⑤ Tape extra 5 V winding.
⑥ Parallel and phase 6.3V ⑨ 9A and 6.3V ⑨ 9A windings for Sec. #4.
⑦ Parallel and phase 6.3V ⑨ 7A and 6.3V ⑨ 1.2A windings for Sec. #4.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: MIRRORTONE PART No.	Stancor PART No.	Merit PART No	Triad PART No	RCA TYPE No.	Halldorson PART No	Thordarson PART No.
T2	Horiz. Output Trans.	THC-10021						
T3	Vert. Output Trans.	TOA-10081	A-8144 ①②	A-3038 ①②	A-99X ①②		21802 ①②	26853 ①②
T4A	Yoke-Horiz. (11.5MH)	YDC-10001 4		MDF-90 ④	Y-50-1	21SD1 ④		Y-14
B	Vert. (40MH)	YD-10014 ③						
		YD-10009 ③						
T5	Focus Coil	FCB-10010						
		FC-10015 ⑤						
		FC-10002 ⑤						
T6	Width (.06-.3MH)	TOA-10023C	WC-1			20IR1		WC-11

① Drill one new mounting hole.
② Connect as auto transformer.
③ Alternate yoke.
④ Use original yoke network and leads.
⑤ Alternate PM magnet used on some models.
⑥ Alternate used on some models.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: MIRRORTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T7	5.1KΩ	3.5Ω	TOC-10034C TOC-10035 ①	A-3877 ①	A-3026	S-3X ①	Z1001	24651 ①	① Drill one new mounting hole. ② Alternate audio output. Trans.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: MIRRORTONE PART No.	VIKING PART No.	QUAM PART No	NOTES
SP1	10"	PM	3.5Ω	SRC-10024A	10J11	10A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MIRRORTONE PART No.	MEISSNER PART No.	MERIT PART No	MILLER PART No	NOTES
L1	VHF Ant. Coils	0Ω CT	0Ω					
L2	Fil. Choke	0Ω						
L3	VHF RF, Mixer Grid & Osc. Coils	0Ω						
L4	Fil. Choke		0Ω					
L5	1st. Video IF	.9Ω						
L6	2nd. Video IF	.1Ω	.1Ω	TSA-10054B	17-1062	TV-116	6250	
L7	Fil. Choke	0Ω		LGA-10019A	19-3001	TV-189	6175	
L8	3rd. Video IF	.1Ω	.1Ω	TSA-10054B	17-1063	TV-116	6249	
L9	4th. Video IF	.1Ω	.1Ω	TSA-10054B	17-1063	TV-116	6249	
L10	5th. Video IF	.1Ω	.1Ω	TSA-10054B	17-1064	TV-116	6250	
L11	Series Peaking Coil	7.5Ω		LGA-10032	19-3125		6153	120 Microhenries
L12	Shunt Peaking Coil	9Ω		LGA-10033	19-3180	TV-184	6180	180 Microhenries
L13	Series Peaking Coil	8Ω		LGA-10034	19-3093	TV-181	6177	100 Microhenries
L14	Sound IF	1.8Ω		TSA-10055C	17-3400	TV-151	1470	
L15	Ratio Det.	8.5Ω	.7ΩCT	TSB-10062A	17-1033	TV-110	1468	Tertiary winding - .3Ω
L16	Horiz. Osc.	65Ω		LGA-10017B	19-1576	TV-163	6210	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: MIRRORTONE PART No	LITTELFUSE PART No		BUSS PART No	
				FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	1/4A 125V		313.500 (3AG S/B - 1.2A)	(2) 121001	MDL 1/2	(2) 4592

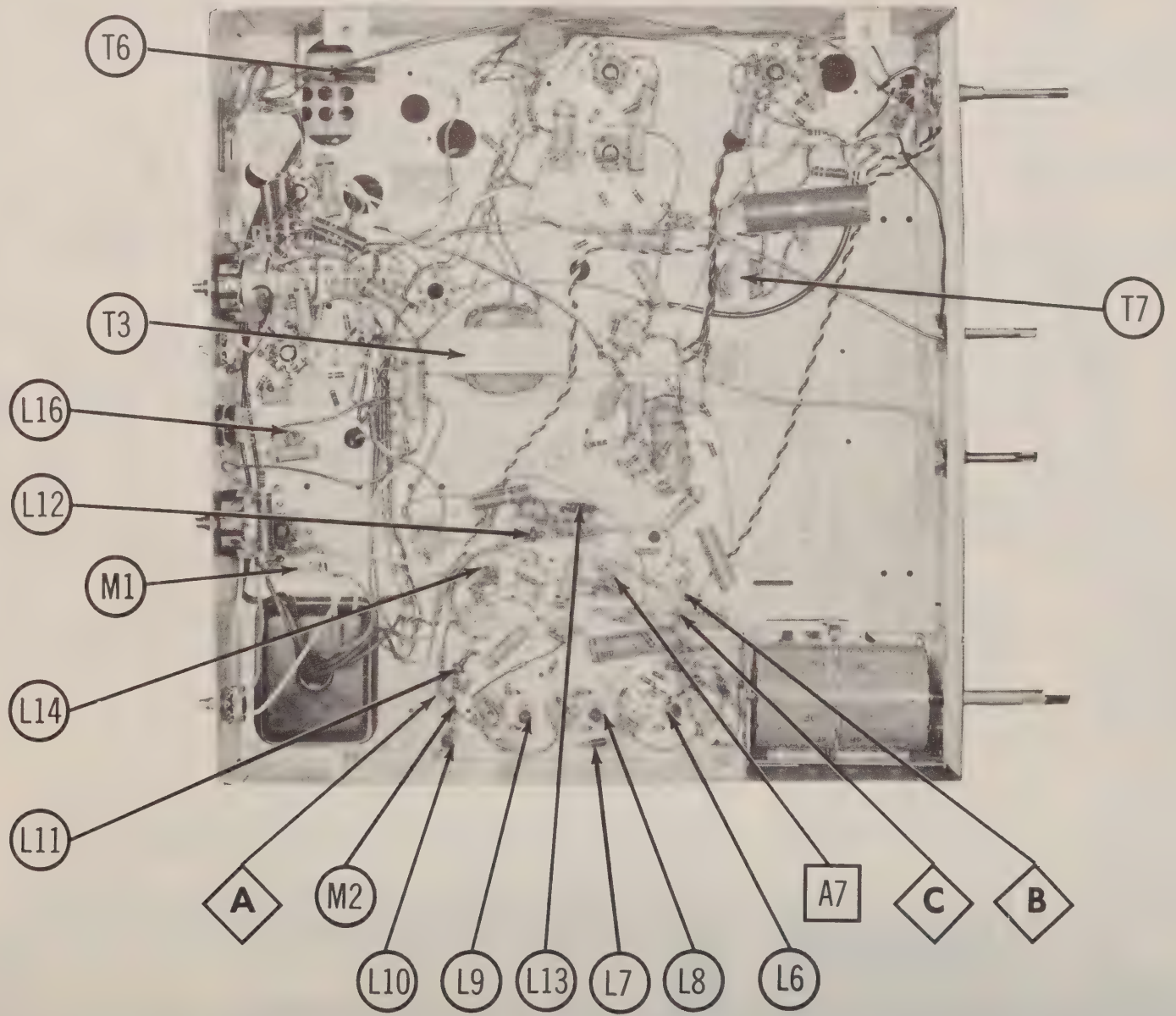
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: MIRRORTONE PART No.	SYLVANIA PART No.	FEDERAL PART No.	NOTES
M2	1N84		1N132, 1N60	1N64A	Video detector

MISCELLANEOUS

ITEM No.	PART NAME	MIRRORTONE PART No.	NOTES
M3A	Tuner	TT-10012	Pentode - Chassis 9051
B	Tuner	TT-10014	Cascode - Chassis 9049
M4	Ion Trap	ITA-10003	
B2	Trimmer Cap.	CTA-10005	Horiz. Drive - 25-280MMF

L F [illegible] SHIP
39-1 MEADE ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

L. F
3824 BLAKE ST
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, check switch on volume control. Check T1. If filaments light check V20. Check B+ filter decoupling network.

SMALL AND/OR DIM PICTURE

Substitute V20. Check B+ filter decoupling network and other associated components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V16, V17, V18, V19 and V20. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check T2, T4A, R93, R94, C68, C67, picture tube and other associated components.	Check C63, C65, R87, R83 and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V16, V17, V18, V19 and V20. Check R92, R86, C64, C3 and other associated components.

BLOOMING

Check by substitution V17, V18, V19 and V20. Check T2, T4A, C68, C67 and other associated components.

GENERAL

RASTER — SOUND — NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER — PICTURE — NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER - NO SOUND — NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6 and V7. Check video and video IF components.

NO RASTER — NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T4 deflection yoke and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

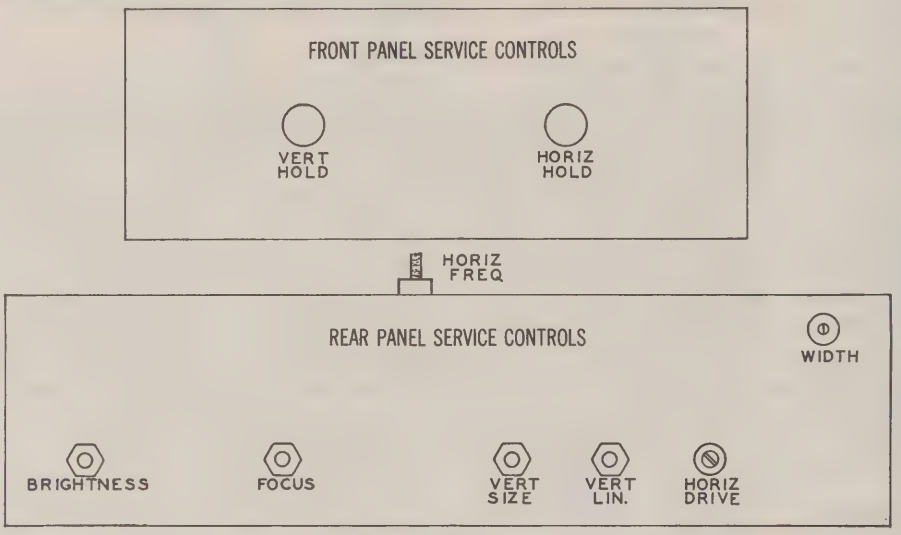
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove four wood screws holding wood strip at the top of the cabinet. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of its range and adjust the Horiz. Freq. slug(L16)until, picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary (L15) located on top of chassis. (See tube placement chart.)

FUSES

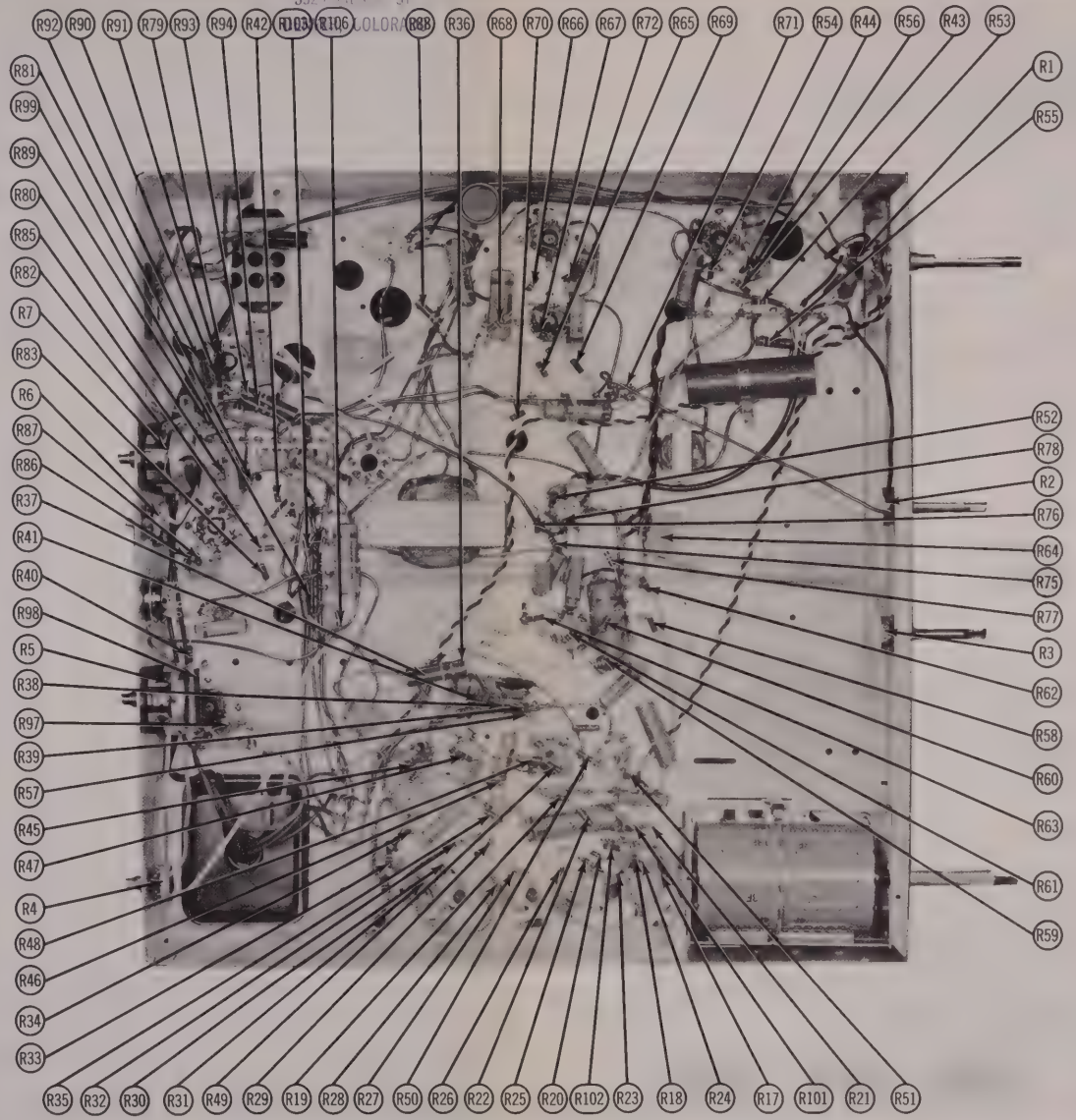
One fuse is used for L. V. Power supply protection. For location see Tube Placement Chart.

CENTERING

Centering is accomplished mechanically by means of a centering lever on the E.M. Focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

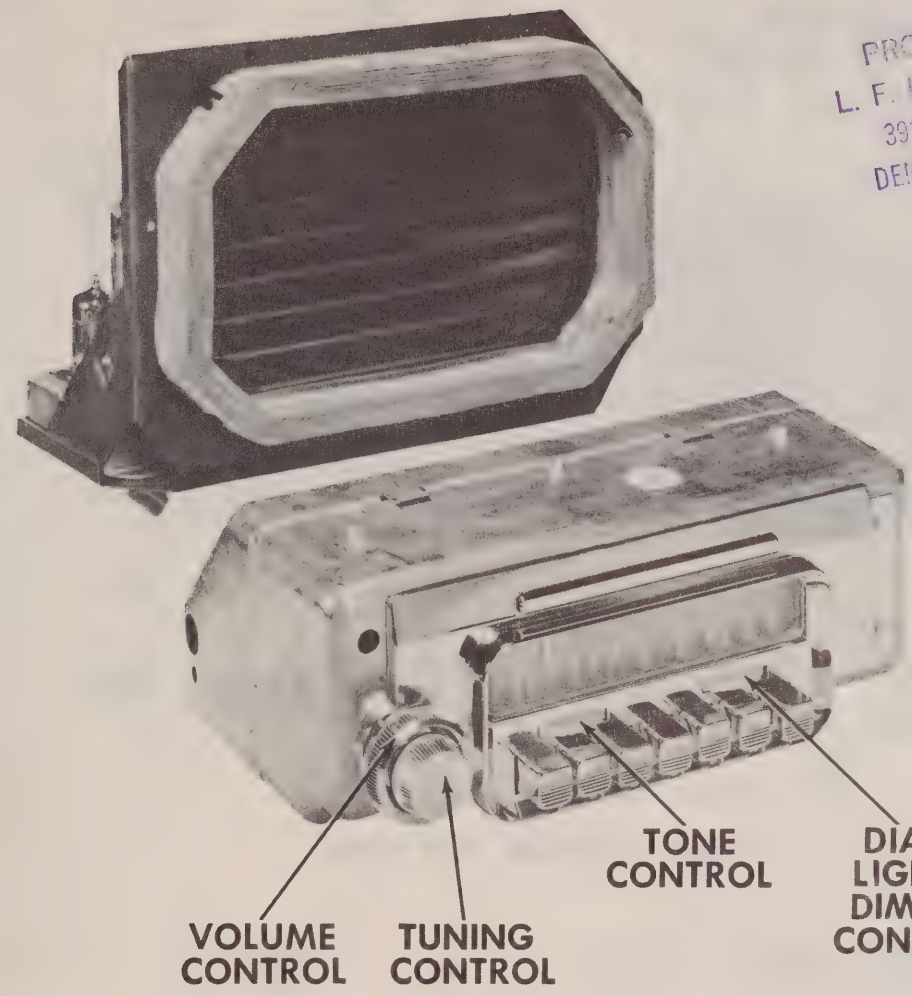
1. Remove 4 push on type control knobs from front panel.
2. Remove 7 wood screws. Remove rear cover.
3. Disconnect built-in-antenna, speaker leads, yoke plug, CRT socket, HV- plug, and ground spring from chassis to yoke brace.
4. Remove 2 wood screws. Remove transmission line from rear of cabinet.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 2 speaker nuts. Remove speaker.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 [illegible] ST.
DENVER, COLORADO

MOPAR
MODEL 829



MOPAR
MODEL 829

TRADE NAME	Mopar Model 829 (For Desoto Model S-19 & S-20 Automobiles)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Eight)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6C4 Phase Inv., (2) 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery RATING 7.1 Amp. @ 6.3 Volts DC
TUNING RANGE-BROADCAST	540-1600KC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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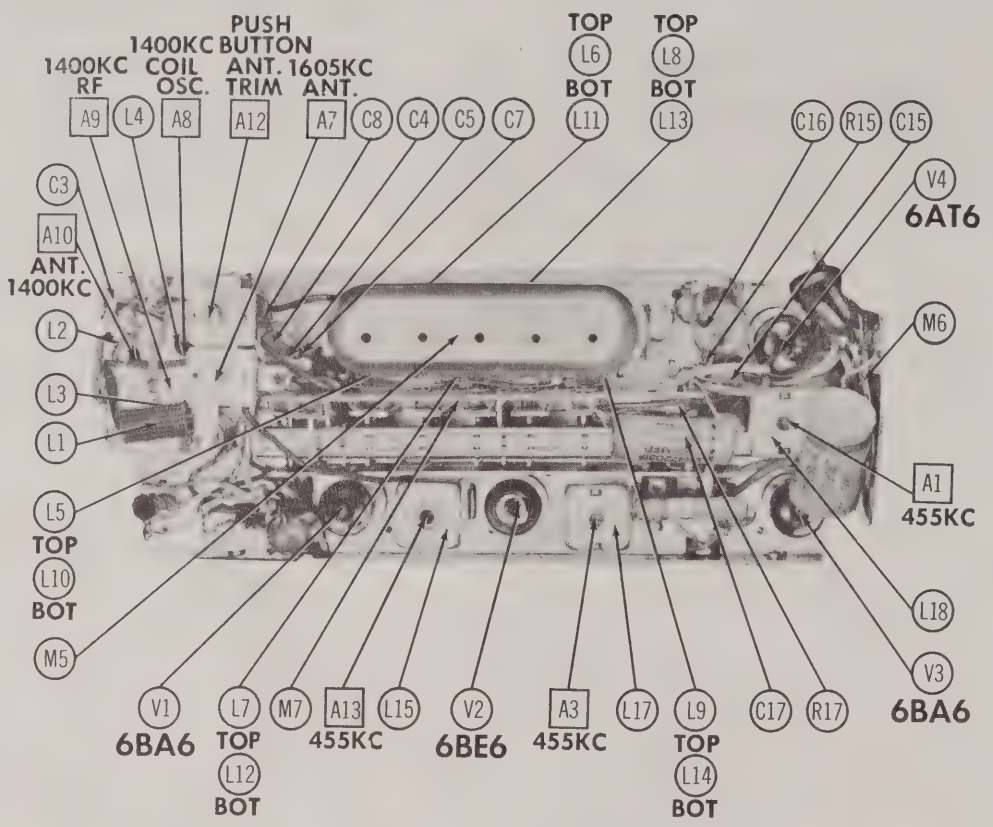
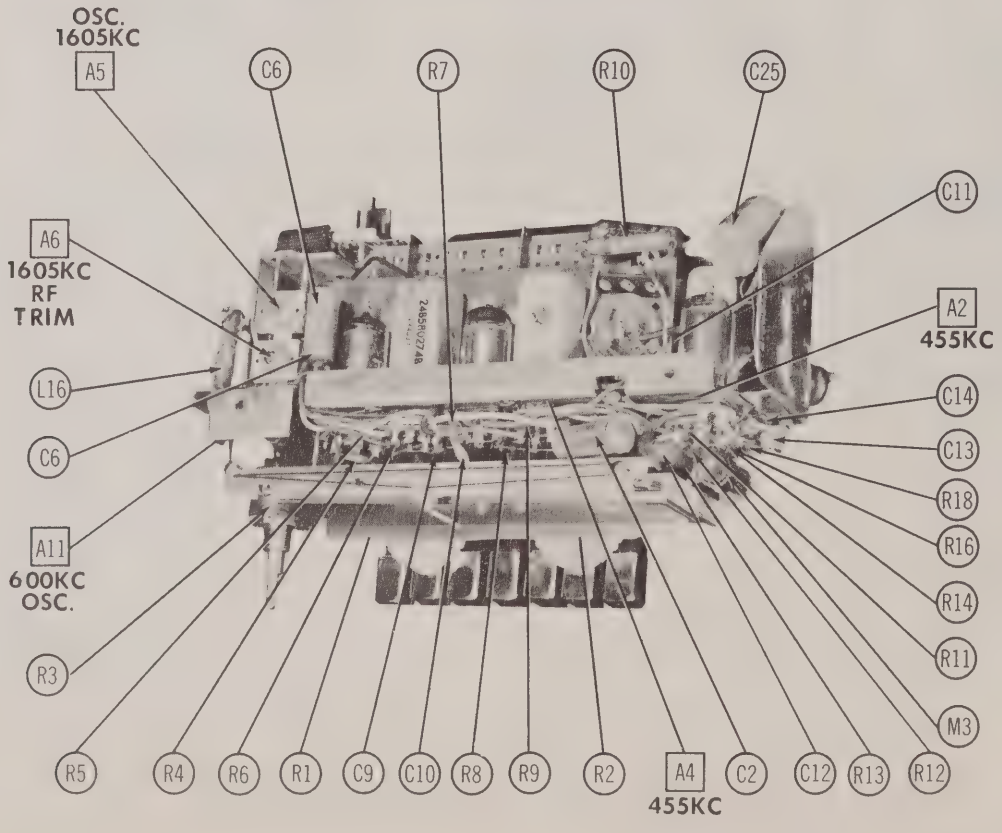


TUNER CHASSIS- TOP VIEW



TUNER CHASSIS- BOTTOM VIEW

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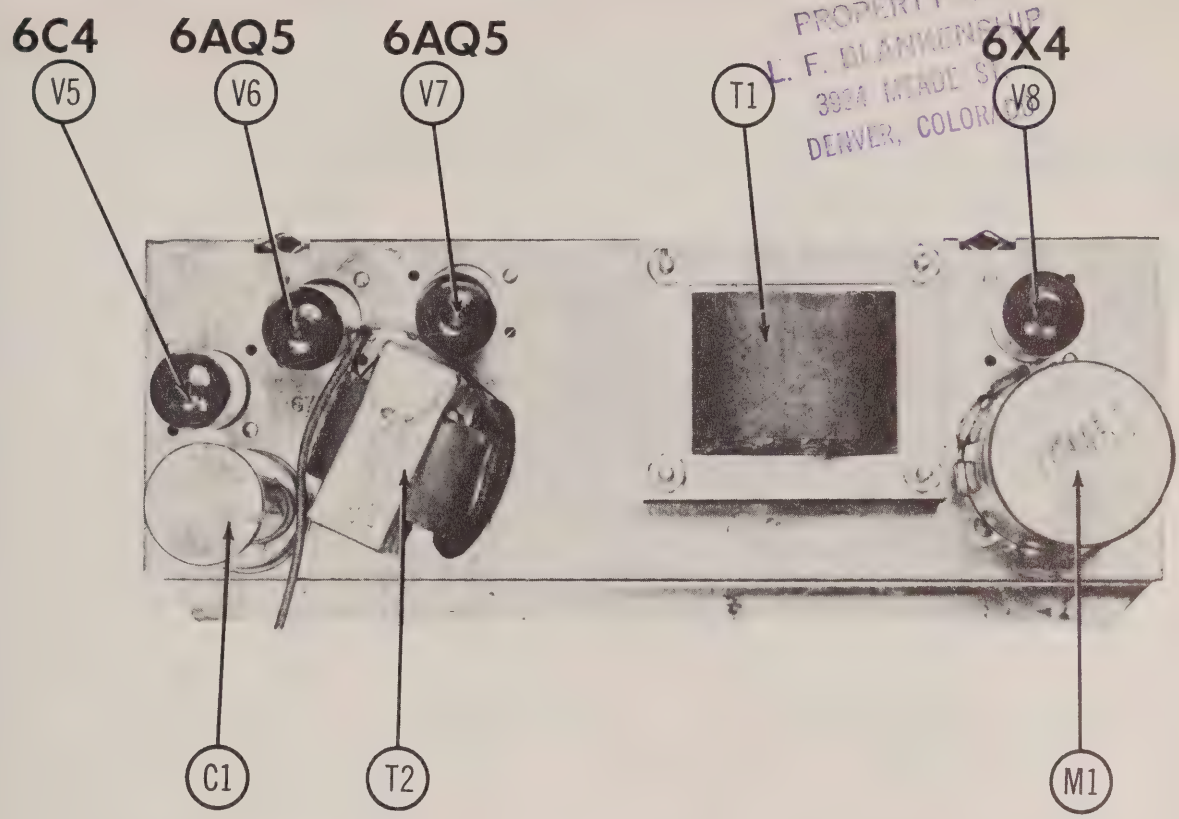
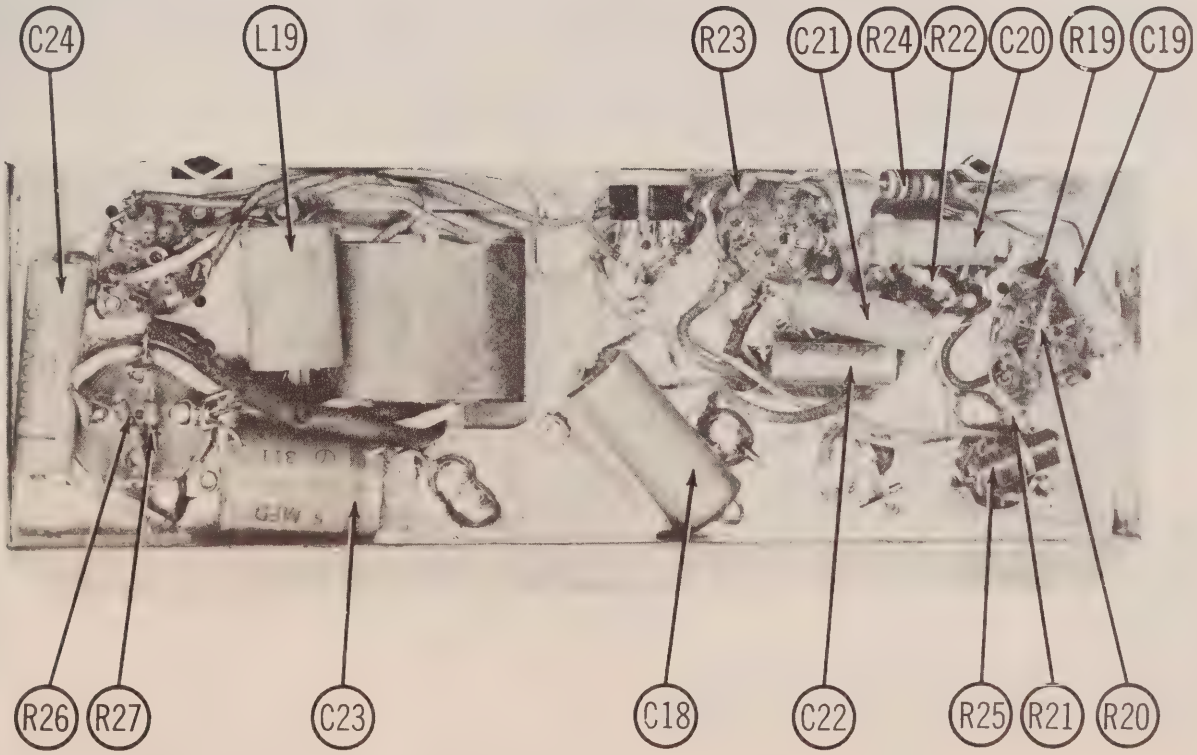
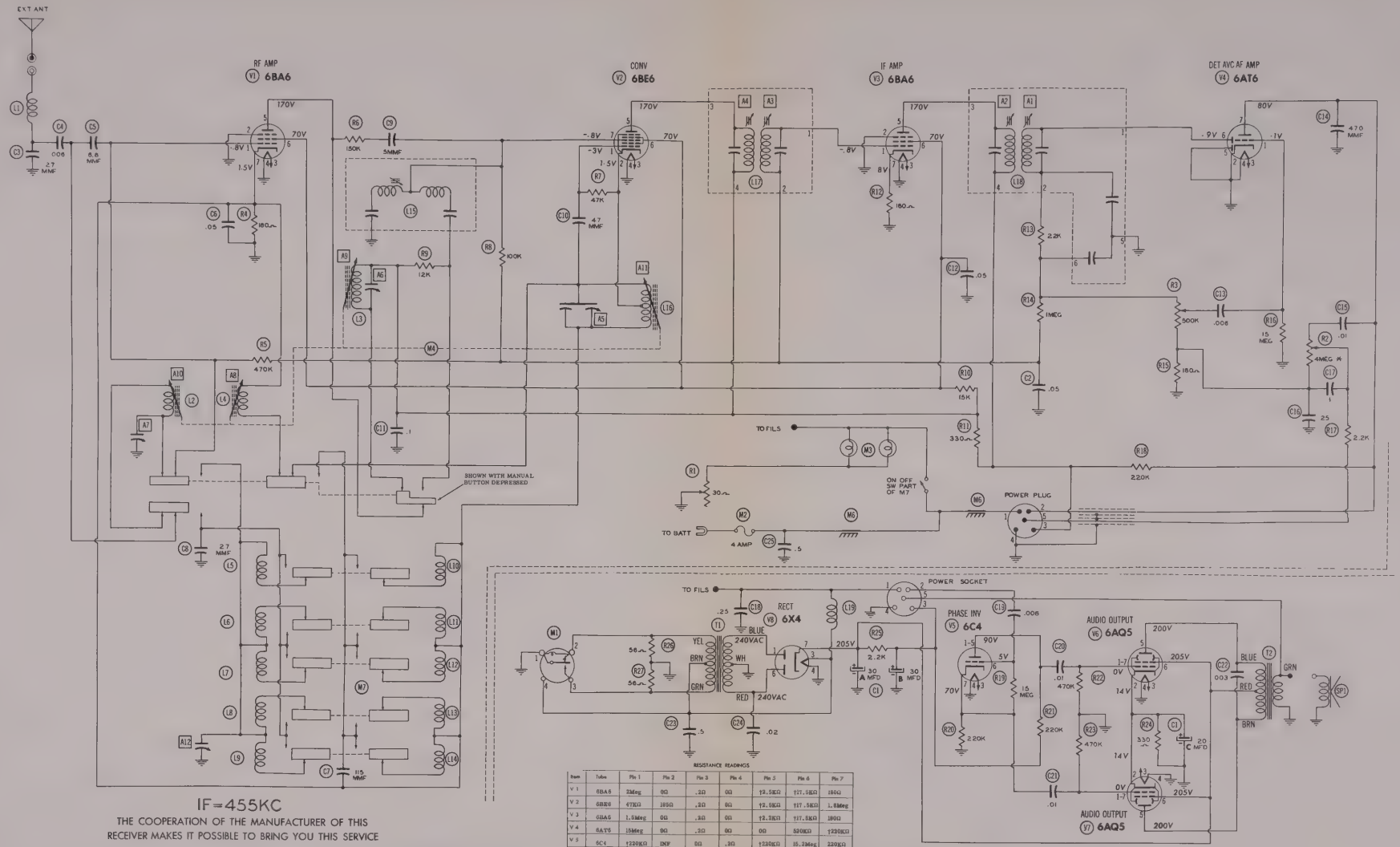
DENVER, COLORADO



POWER CHASSIS-TOP VIEW



POWER CHASSIS-BOTTOM VIEW



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	2Meg	0Ω	.2Ω	0Ω	†2.5KΩ	†17.5KΩ	180Ω
V 2	6BE6	47KΩ	185Ω	.2Ω	0Ω	†2.5KΩ	†17.5KΩ	1.6Meg
V 3	6BA6	1.6Meg	0Ω	.2Ω	0Ω	†2.2KΩ	†17.5KΩ	180Ω
V 4	6AT6	15Meg	0Ω	.2Ω	0Ω	0Ω	520KΩ	†220KΩ
V 5	6C4	†220KΩ	INF	0Ω	.2Ω	†220KΩ	15.2Meg	220KΩ
V 6	6AQ5	470KΩ	330Ω	.2Ω	0Ω	†290Ω	†0Ω	470KΩ
V 7	6AQ5	470KΩ	330Ω	.2Ω	0Ω	†290Ω	†0Ω	470KΩ
V 8	6X4	365Ω	INF	.2Ω	0Ω	INF	410Ω	500KΩ

ALL READINGS TAKEN IN MANUAL POSITION
† MEASURED FROM PIN 7 OF V8

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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247-7

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use Motorola alignment tool #66A76A78 or equivalent for adjusting tuner cores.
After the receiver has been properly aligned and calibrated, tune in a 1400KC signal and set pointer to the index mark between "13" and "15" on the dial scale.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400%Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Attenuate generator output to maintain approximately 1.8 volts on output meter. Adjust until maximum output is obtained.
2.	Fig. 1	Thru dummy (Fig.1) to antenna receptacle.	1605KC	"	"	A5, A6 A7	The oscillator and RF cores should project 1 1/8" from cans. Adjust in order given for maximum output.
3.	"	"	1400KC	Spacing between carriage plate and coil shield plate should be 3/8".	"	A8, A9 A10	Adjust in order given for maximum output.
4.	"	"	Turn off Generator	600KC	"	A11	This adjustment should be made only if padder is known to be incorrectly set. Replace front cover. Peak A11 for maximum noise. If A11 requires more than ½ turn, repeat steps 2, 3 and 4 until A11 requires not more than ½ turn.

PUSH BUTTON RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
5.	Fig. 1	Thru dummy (Fig.1) to antenna receptacle	1400KC	Set push button #6 to 1400KC	Across voice coil	A12	Adjust for maximum output.
6.	"	"	1605KC	Set push button #6 to 1605KC	"	A12	The push button tracking nuts (the 5 brass hex nuts on main chassis) should not require adjustment unless components have been changed in push button assembly. Adjust A12 for maximum output.
7.	"	"	1400KC	Set push button #6 to 1400KC	"		Peak push button #6 tracking nut for maximum output. Repeat steps 6 and 7 until maximum output is obtained.
8.	"	"	1020KC	Set push button #5, #4 and #3 to 1020KC	"		Peak push button #5, #4 and #3 tracking nuts for maximum output.
9.	"	"	600KC	Set push button #2 to 600KC	"		Peak push button #2 tracking nut for maximum output.
10.	"	"	455KC (400%Mod)	Set push button #2 to 600KC	"	A13	Adjust for MINIMUM output.

PUSH BUTTON ALIGNMENT

The push buttons should be tuned to stations within the following frequency ranges.

Pushbutton #2 - 535-1020KC
Pushbutton #3 - 610-1200KC
Pushbutton #4 - 700-1410KC
Pushbutton #5 - 740-1480KC
Pushbutton #6 - 840-1600KC

Pushbutton #1 (manual tuning) is located at extreme left under low frequency end of dial.
To set pushbutton #2 thru #6 remove the pushbutton covers. Manually tune in the selected station for pushbutton #2. Press pushbutton #2 all the way in and turn the knurled knob until the desired station is tuned on. Repeat procedure for remaining pushbuttons. Replace pushbutton covers.

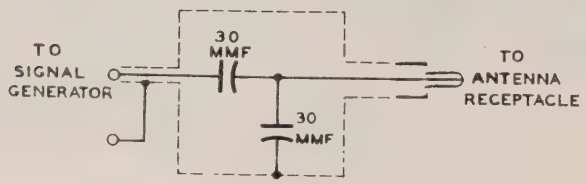

FIG.1

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp	6AT6	6AT6	7BT	
V5	Phase Inverter	6C4	6C4	6BG	
V6	Audio Output	6AQ5	6AQ5	6BZ	
V7	Audio Output	6AQ5	6AQ5	7BZ	
V8	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■30	350	23A473015	AFH3-169		C131		FP331	TVL-3620	
B	▲30	300								
C	20	25								
C2	.05	100	BR13514	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	27		21R120567	SI27	D6-270	TP26	GP1K-270	UC-5427	5GA-Q27	
C4	.006	100	8C4529	P288-006	D6-602	PJ2D6	GP2-333-602	PT426	2TM-D6	
C5	*6.8		21R120561	SI6.8NP0	TCZ-6.8	TP07	NP0A-6R8	ZT-5568	5TCCB-V68	
C6	.05	100	8R13514	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C7	115		21K502851							
C8	27		21R120567	SI27	D6-270	TP26	GP1K-270	UC-5427	5GA-Q27	
C9	5		21R115955	SI5NP0	D6-050	TP06	GP1K-050	ZT-555	5GA-V5	
C10	47		21R115890	SI47NP0	TCZ-47	Z033	NP0L-471	ZT-5447	5TCC-Q47	
C11	.1	400	8R13166	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C12	.05	100	BR13514	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C13	.006	100	8A4529	P288-006	D6-602	CUB6D6	GP2-333-602	PT626	2TM-D6	
C14	470		21R114554	BPD-00047	D6-471	K060	GP2K-471	UC-5347	5GA-T47	
C15	.01	400	8R23690	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C16	.25	100	8R4283	P288-25		PJ2P25		PT4025	2TM-P25	
C17	.1	100	8A472035	P288-1	DF-104	PJ2P1		PT401	2TM-P4	
C18	.25	100	8R4283	P288-25		PJ2P25		PT4025	2TM-P25	
C19	.006	400	8K71910	P488-006	D6-602	CUB6D6	GP2-333-602	PT426	4TM-D6	
C20	.01	400	8R23690	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C21	.01	400	8R23690	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C22	.003	400	8R490437	P488-003	D6-302	CUB4D3	GP2-333-302	PT423	4TM-D3	
C23	.5	100	8C580845	VHC-36		MP2P5		RF480	HC-3	
C24	.02	1000	8K114137	P1088-02		CUB16S2		PT1612	MB-S2	
C25	.5	100	8C580845	VHC-36		MP2P5		RF480	HC-3	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	30Ω	2	17A502225					Dimmer
R2	*		18B530820					Tone
R3	500KΩ	½	18A530623					Volume

* Center open, 2 Meg each half.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R4	180Ω	½		BTS-180	
R5	470KΩ	½		BTS-470K	
R6	150KΩ	½		BTS-150K	
R7	47KΩ	½		BTS-47K	
R8	100KΩ	½		BTS-100K	
R9	12KΩ	1		BTA-12K	
R10	15KΩ	2		BTB-15K	
R11	330Ω	½		BTS-330	
R12	180Ω	½		BTS-180	
R13	22KΩ	½		BTS-12K	
R14	1 Meg	½		BTS-1 Meg	
R15	180Ω	½		BTS-180	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R16	15 Meg	½		BTS-15 Meg	
R17	2200Ω	½		BTS-2200	
R18	220KΩ	½		BTS-220K	
R19	15 Meg	½		BTS-15 Meg	
R20	220KΩ	½		BTS-220K	
R21	220KΩ	½		BTS-220K	
R22	470KΩ	½		BTS-470K	
R23	470KΩ	½		BTS-470K	
R24	330Ω	1		BTA-330	
R25	2200Ω	2		BTB-2200	
R26	56Ω	½		BTS-56	
R27	56Ω	½		BTS-56	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6.3VCT @ 4A	445VCT .058ADC			25C501644-J		P-3068 ①			

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	7.3KΩ CT	3.3Ω	25B530924-0	A-3850	A-2900	S-7X	Z1000	TS-24S60	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6"x 9"	PM	3.3Ω	50C530776 50C502337 ① 50C502190 ① 50C530767 ①	ST-810 Mod P69-V	69A2	① Alternate 6" x 9" PM speaker

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coupling	0Ω		24B580540			4626	26 Microhenries
L2	Ant. Coil	13Ω		24K531275				Manual tuning
L3	RF Coil	14Ω		24K531277				Manual tuning
L4	Osc. Coil	3.2Ω		24K531276				Manual tuning
L5	Ant. Coil	17Ω						Push button tuning; Note 1
L6	Ant. Coil	15Ω						Push button tuning; Note 1
L7	Ant. Coil	13Ω						Push button tuning; Note 1
L8	Ant. Coil	13Ω						Push button tuning; Note 1
L9	Ant. Coil	12Ω						Push button tuning; Note 1
L10	Osc. Coil	3.2Ω						Push button tuning; Note 2
L11	Osc. Coil	2.7Ω						Push button tuning; Note 2
L12	Osc. Coil	2.4Ω						Push button tuning; Note 2
L13	Osc. Coil	2.3Ω						Push button tuning; Note 2
L14	Osc. Coil	2.1Ω						Push button tuning; Note 2
L15	IF Trap	95Ω		24B580274				Tapped @ 65Ω
L16	Osc. Padder Coil	6.5Ω		24K501921	14-1033	BC-400	m-Osc.	Tapped @ 1.3Ω
L17	Input IF	18Ω	18Ω	24C485553 *	16-6758	BC-352	12-C1	
L18	Output IF	18Ω	18Ω	24K485555	16-6770	BC-355	12-C6	
L19	Vibrator Hash Choke	.1Ω		24A472535		BC-537	5221	

Note 1. L5-L9 not replaceable separately; part of push button assembly, see miscellaneous.
Note 2. L10-L14 not replaceable separately; part of push button assembly, see miscellaneous
* Alternate Part # 24K502819.

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PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

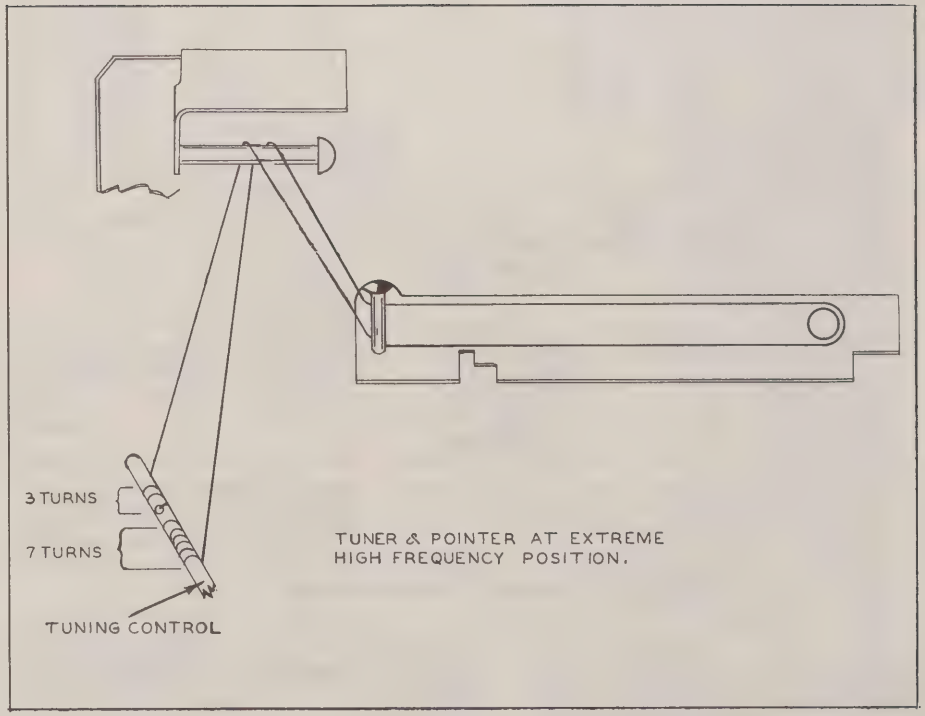
ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115∿	48B3333	5342	859	5342	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	65K12894	9K531028 ("A" lead assembly with fuse)	307014. (SFE-14A)	155014	SFE14	HDI

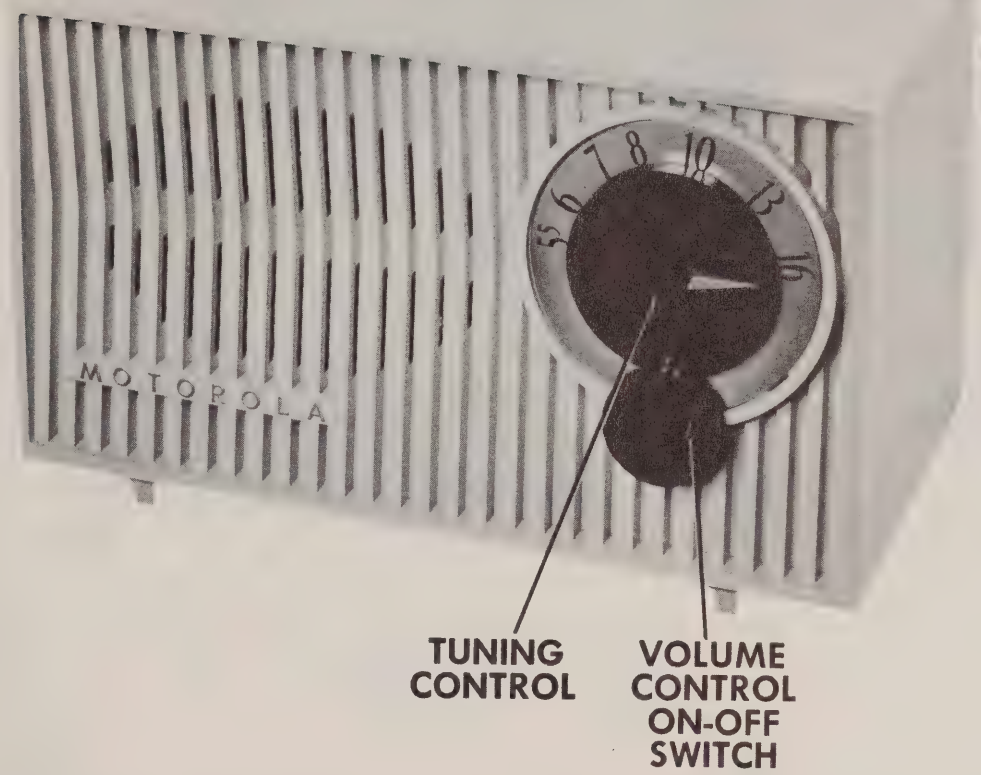
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial light	65X11854	# 47 - 2 used
M4	Tuner	77K530831	Manual-complete assembly
M5	Tuner	77K530832	Push button assembly complete
	Coils		(5 antenna coils-part of P. B. assembly
			(5 osc. coils-part of P. B. assembly)
M6	Spark plate	64A530388	2 used
M7	Switch		Push button assembly (part of 77K530832)
A7, A12	Trimmer cap	20K531671	Ant. Coil-manual (dual unit 20-180MMF
		20K531671	Ant. coils-push button & 75-380MMF)
A5, A6	Trimmer cap	20A501888	Osc. coil-manual (dual unit 20-120MMF
		20A501888	Osc. coils-push button & 395-470MMF)
	Knob	36A530806	Tuning
	Knob	36B530697	Volume
	Knob	36K530755	Dimmer
	Knob	36K530754	Tone
	Push button	1V502121	and arm assembly-for OFF & DIAL
	Push button	1A502122	and arm assembly-for stations (5)
	Cap	15A530377	Push button



DRIVE CORD STRINGING

MOTOROLA MODELS 53R1, U, 53R2, U, 53R3, U, 53R4, U, 53R5, U, 53R6, U (Ch. HS-384, HS-426)



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DENVER, COLORADO

MOTOROLA MODELS 53R1, U, 53R2, U, 53R3, U, 53R4, U, 53R5, U, 53R6, U (Ch. HS-384, HS-426)

TRADE NAME	Motorola Models 53R1, 2, 3, 4, 5, 6 (Ch. HS-384), 53R1U, 2U, 3U, 4U, 5U, 6U (Ch. HS-426)
MANUFACTURER	Motorola, Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.	"	Loop	1400KC	Tune for maximum signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	23B630155	AFH2-15		B015		FP213	TVL-2432	
B	30	150								
C2	.05	200	8R120842	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3A	220									
B	5000									
C	5000		♦21B630180	♦PA-113-2	♦PC-156	♦116TM2	♦1408-02		♦DT-2	
D	250									
E										
C4	10000		21R120853	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C5	.047	400	8K490232	489ZX-047	DF-503	PJ4S47		PT4147	4TM-S47	

♦ Items C3A, C3B, C3C, C3D, C3E, R5A, R5B and R5C are combined in one unit.
When replacing items separately items C3D and C3E total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	18A630184	Q13-137	A47-1 Meg-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

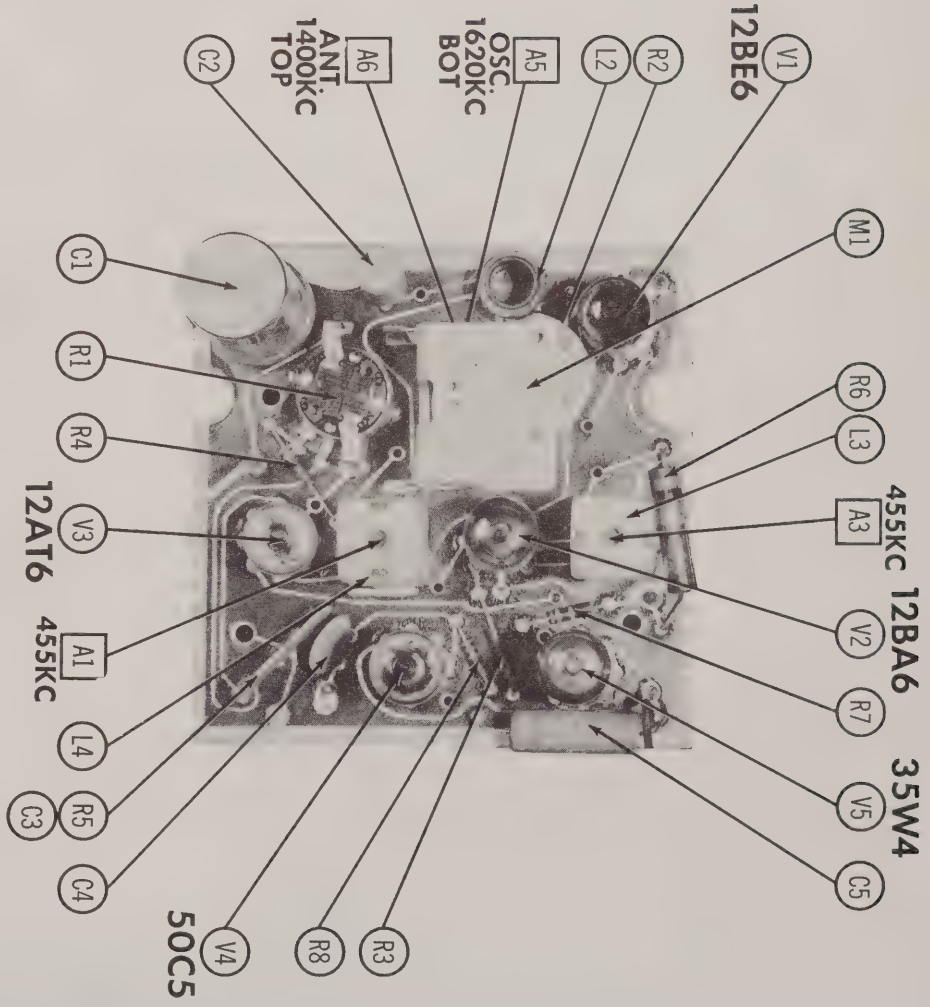
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	22KΩ	½	6R6028	BTS-22K	
R3	100Ω	½	6R6018	BTS-100	
R4	3.3Meg	½	6R2118	BTS-3.3Meg	
R5A	6.8Meg	½		BTS-6.8Meg	
B	470KΩ	½	♦21B630180	BTS-470K	
C	470KΩ	½		BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R6	1000Ω	2	6R76004	BTB-1000	
R7	27Ω	½	6R5683	BTS-27	
R8	150Ω	½	6R3992	BTS-150	

♦ Items R5A, R5B, R5C, C3A, C3B, C3C, C3D, C3E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.4KΩ	3.3Ω	25B630219						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4 x 6"	PM	3.3Ω	50C631448 50C630220 ①			① Alternate PM speaker

COILS (RF-IF)

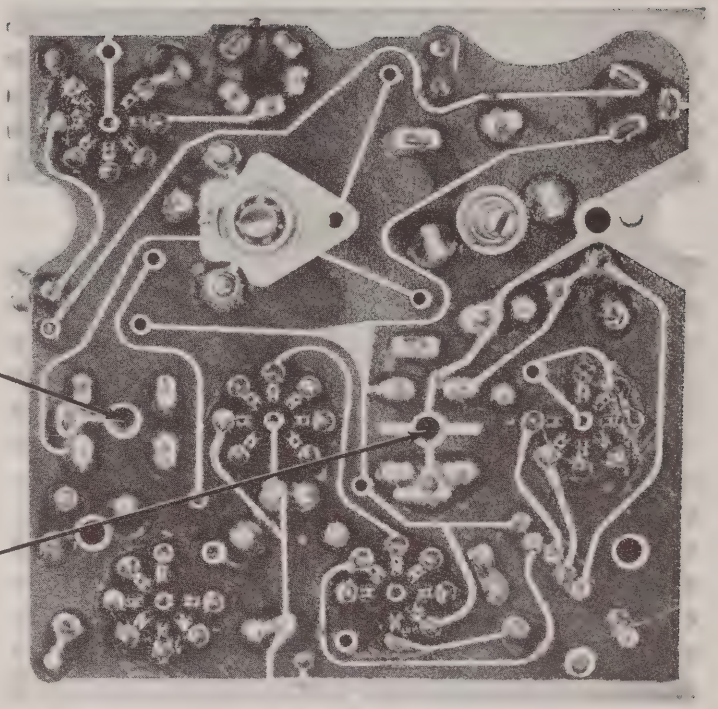
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.2Ω		24B630316				Includes panel assembly & line cord.
L2	Osc. Coil	.9Ω	10.5Ω	24B630327	14-1073		69-Osc. †	
L3	Input IF	15Ω	15Ω	24C630284	16-6758	BC-352	12-C1	
L4	Output IF	15Ω	15Ω	24K630898	16-6758	BC-353	12-C2	

† Use connecting wires as mounting support.

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Tuning cap	19B630262	28-380 & 14-120MMF
	Cabinet	16E630169	Walnut 53R1 & 1U
	Cabinet	16K630171	Ivory 53R2 & 2U
	Cabinet	16K630172	Yellow 53R3 & 3U
	Cabinet	16K630173	Gray 53R4 & 4U
	Cabinet	16K630174	Green 53R5 & 5U
	Cabinet	16K630175	Red 53R6 & 6U
	Knob	36B630241	Tuning
	Knob	36B630242	Volume
	Dial scale	34B630265	

CHASSIS—BOTTOM VIEW



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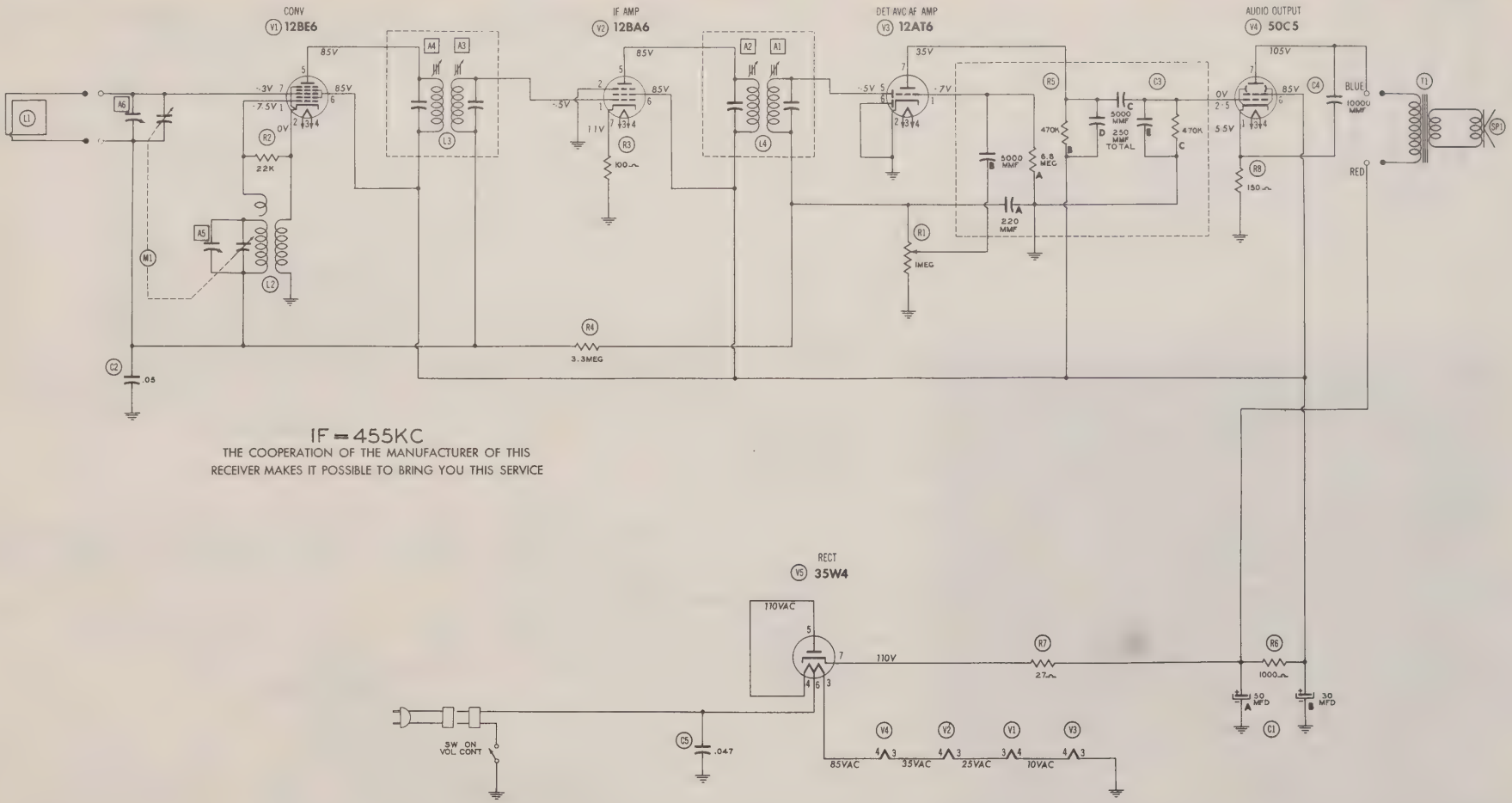
MOTOROLA
MODEL 53R1, (Ch. HS-426)



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	1Ω	26Ω	14Ω	†1KΩ	†1KΩ	4.3Meg
V 2	12BA6	4.3Meg	0Ω	28Ω	38Ω	†1KΩ	†1KΩ	100Ω
V 3	12AT6	6.8Meg	0Ω	0Ω	14Ω	1Meg	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	38Ω	88Ω	470KΩ	†1KΩ	†200Ω
V 5	35W4	INF	INF	88Ω	122Ω	122Ω	115Ω	150KΩ

† MEASURED FROM PIN 7 OF V5

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RETMA MEMBER

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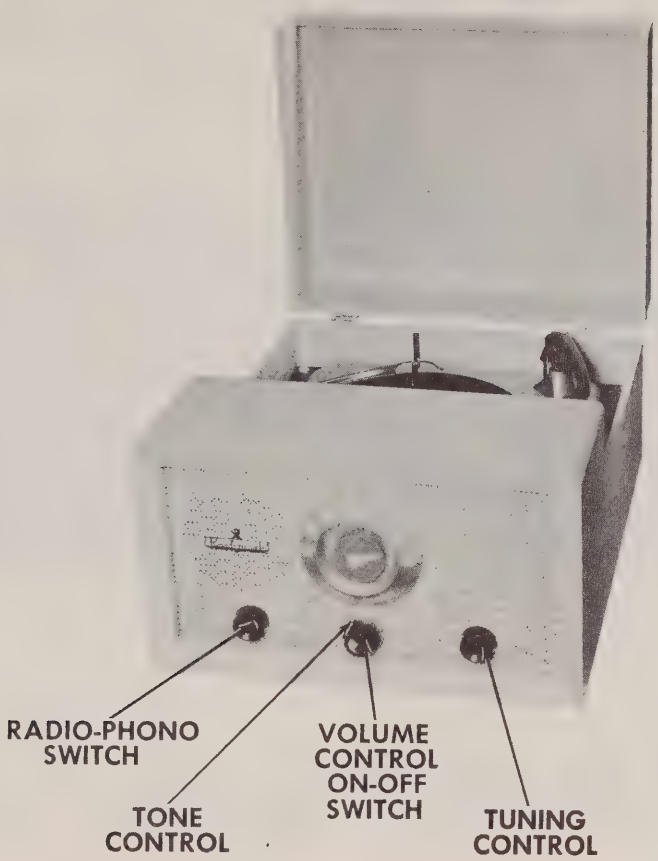
ROLAND
MODELS 5X3, 5X4



ROLAND
MODELS 5X3, 5X4

TRADE NAME	Roland Models 5X3, 5X4
MANUFACTURER	Roland Radio Corp., 12-30 Anderson Ave., Mt Vernon, N.Y.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver With 3 Speed Automatic Record Changer
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to antenna stator lug on tuning gang. Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune for maximum signal	"	A6	"
4.		"	600KC	"	"	A7	Adjust for maximum deflection by sliding coil along loop stick.

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - SEE V-M MODEL 950 - PHOTOFACT SET 216, FOLDER 11.

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PARTS LIST AND DESCRIPTIONS

ROLAND MODEL 5X3

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ROLAND PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AF-Amplifier	12AT6	12AT6	7BT	
V4	Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ROLAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	C-5-415A	PRS150/50-30-20		BBR T44215		3N532	TVA-3448	Red
B	40	150								Red
C	20	150								Green
C2	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	270			SI270	D6-271	TP41	GP1K-271	UC-5327	5GA-T27	
C4	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C5	180			SI180N750	TCN-180	TN28	N750-303-181			
C6	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C7	.002	600		P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C8	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C9	.01	600		689ZX-01	D6-103	PJ6S1	GP2-333-103	PT611	6TM-S1	
C10	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ROLAND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	BA022-033	QJ-477R *			UF55A	Volume - Panel
B	500KΩ						UR55L	Tone-Rear
C	Switch						US-26	Attach to R1B

* CONCENTRIKIT EQUIVALENT -KIT K-2, BASE ELEMENTS & SHAFTS B13 & P1-106 (Panel) B11-133 & R1-122 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ROLAND PART No.	IRC PART No.	NOTES
R2	22KΩ	½		BTS-22K	
R3	220Ω	½		BTS-220	
R4	2.2 Meg	½		BTS-2.2 Meg	
R5	4.7Meg	½		BTS-4.7Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ROLAND PART No.	IRC PART No.	NOTES
R6	220KΩ	½		BTS-220K	
R7	150Ω	1		BTA-150	
R8	18Ω	½			
R9	330Ω	1		BTA-330	
R10	2200Ω	1		BTA-2200	

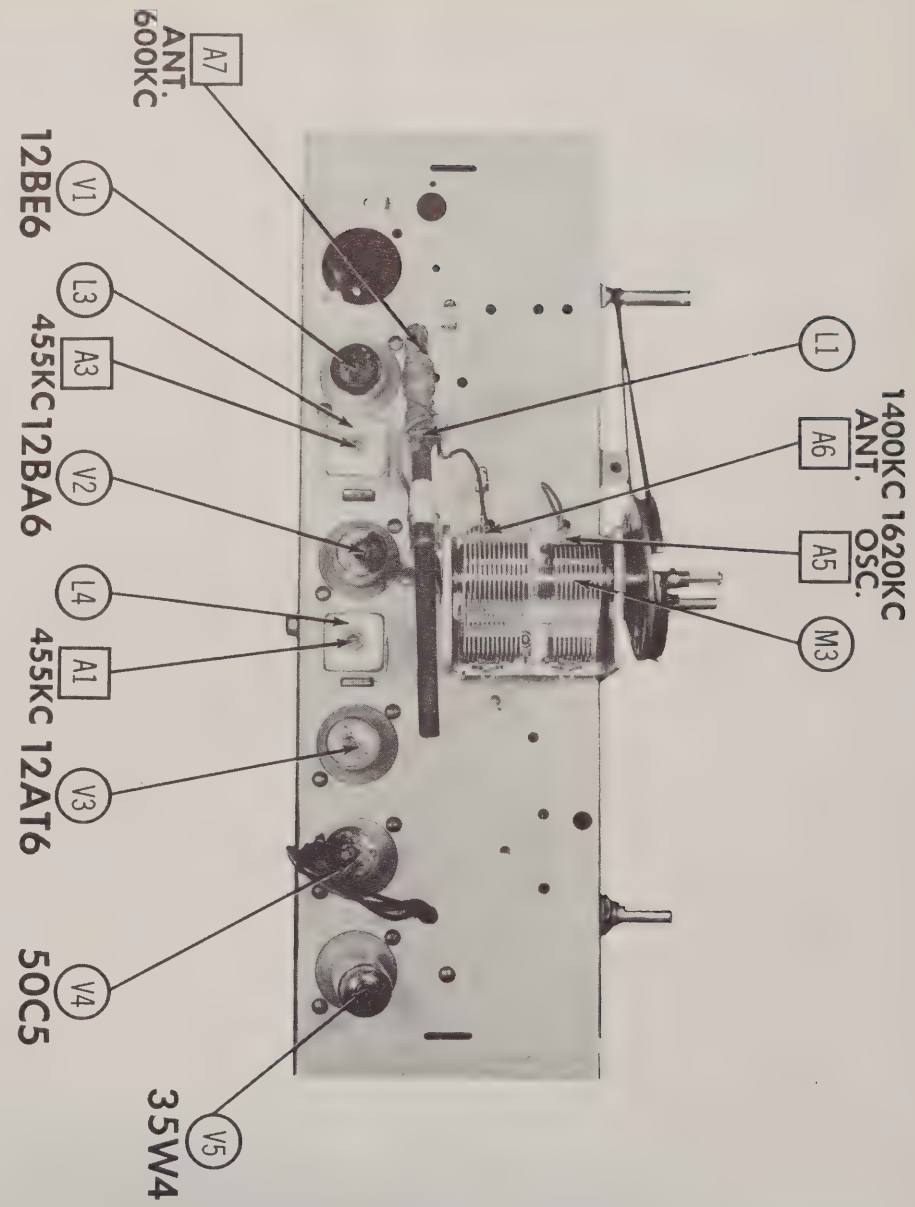
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: ROLAND PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.4KΩ	3.4Ω		A-3876	A-2928	S-1X	Z1101 ①	TS-24S50	① Tape 5% TAP

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: ROLAND PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3.4Ω		ST-105 Mod P5-X	5A1	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ROLAND PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	.8Ω						
L2	Osc. Coil	.6Ω	6Ω		14-1073		69-Osc.	
L3	Input IF	25Ω	25Ω	LF-50	16-6758	BC-352	12-C1	
L4	Output IF	25Ω	25Ω	LF-50	16-6758	BC-353	12-C2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA ROLAND PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M1						43	0-2 or S-2	

ELECTRO-VOICE NEEDLE LISTING SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

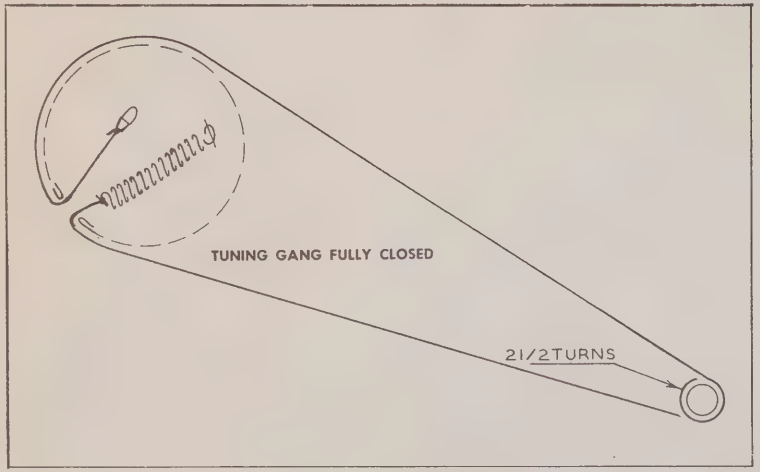
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA ROLAND PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2		*S-66	*AC-434 *♦AC-434D1 *♦AC-434D2 ♦AC-434D	*W-75TPS	* Metal ♦Diamond

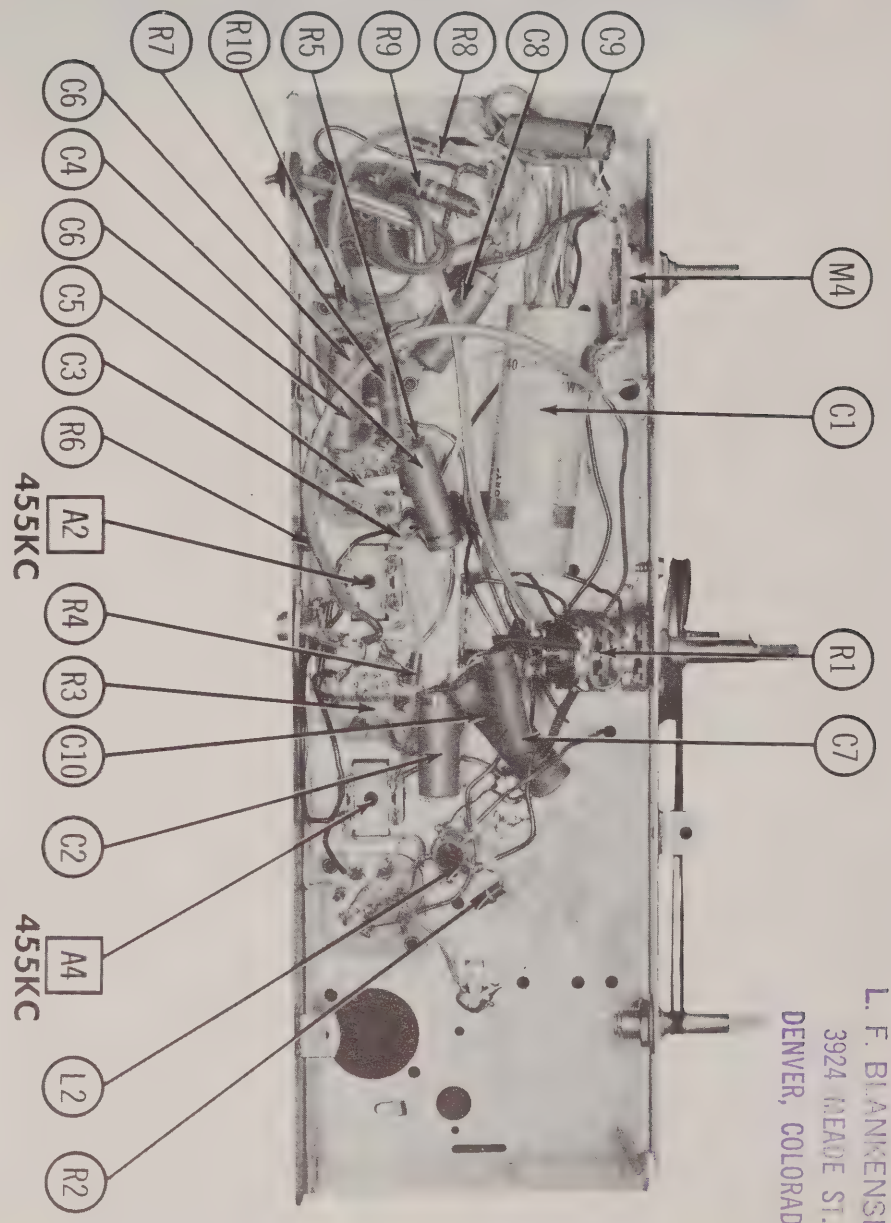
MISCELLANEOUS

ITEM No.	PART NAME	ROLAND PART No.	NOTES
M3	Tuning cap	CV-20A	(29-457MMF, 32-190MMF)
M4	Switch		Radio-phono



DRIVE CORD STRINGING

CHASSIS—BOTTOM VIEW



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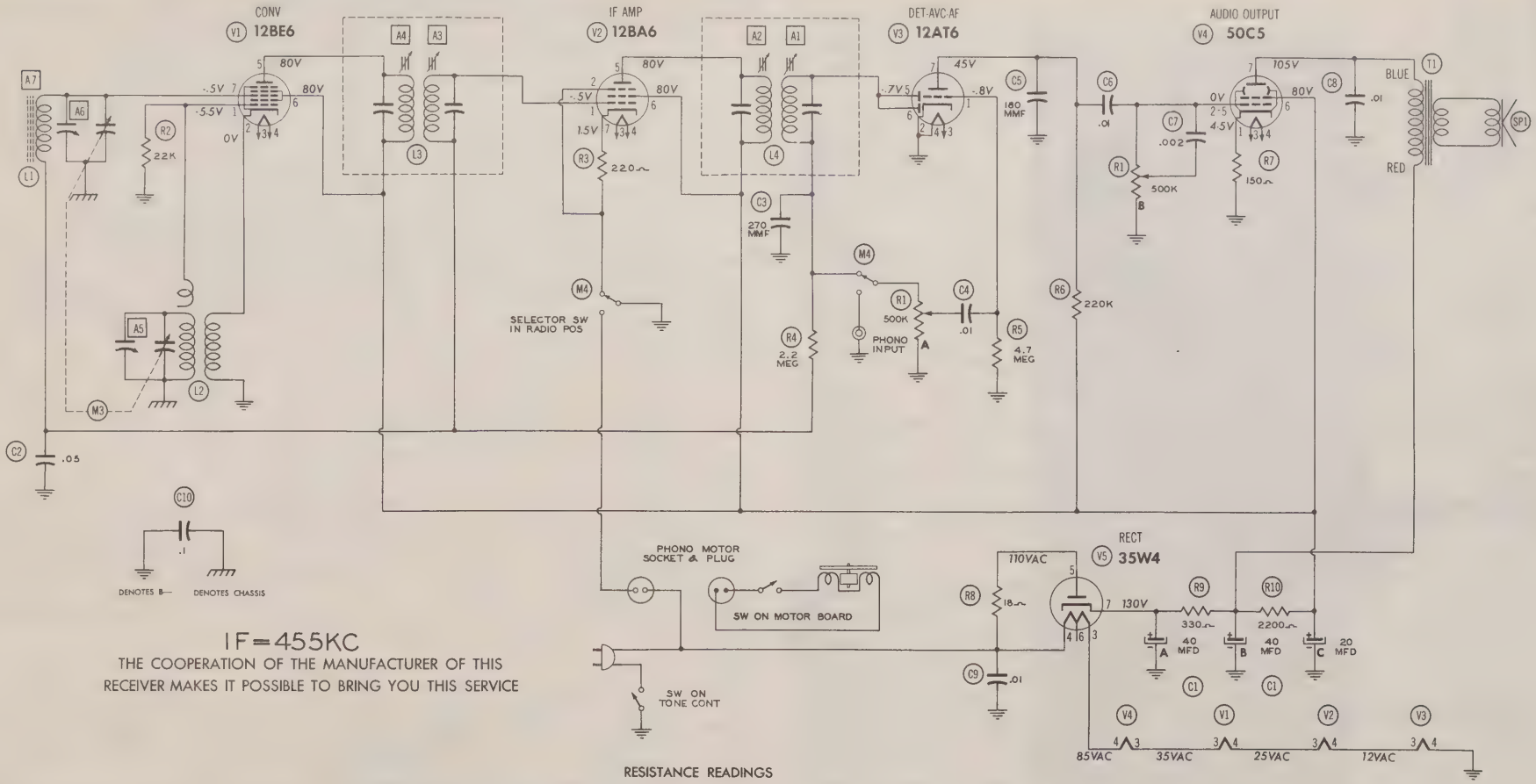

IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.6Ω	38Ω	25Ω	†2.5KΩ	†2.5KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	25Ω	13Ω	†2.5KΩ	†2.5KΩ	220Ω
V 3	12AT6	4.7Meg	0Ω	13Ω	0Ω	500KΩ	500KΩ	†220KΩ
V 4	50C5	150Ω	500KΩ	38Ω	85Ω	500KΩ	†2.5KΩ	†500Ω
V 5	35W4	†330Ω	INF	85Ω	125Ω	145Ω	120Ω	150KΩ

† MEASURED FROM PIN 7 OF V5

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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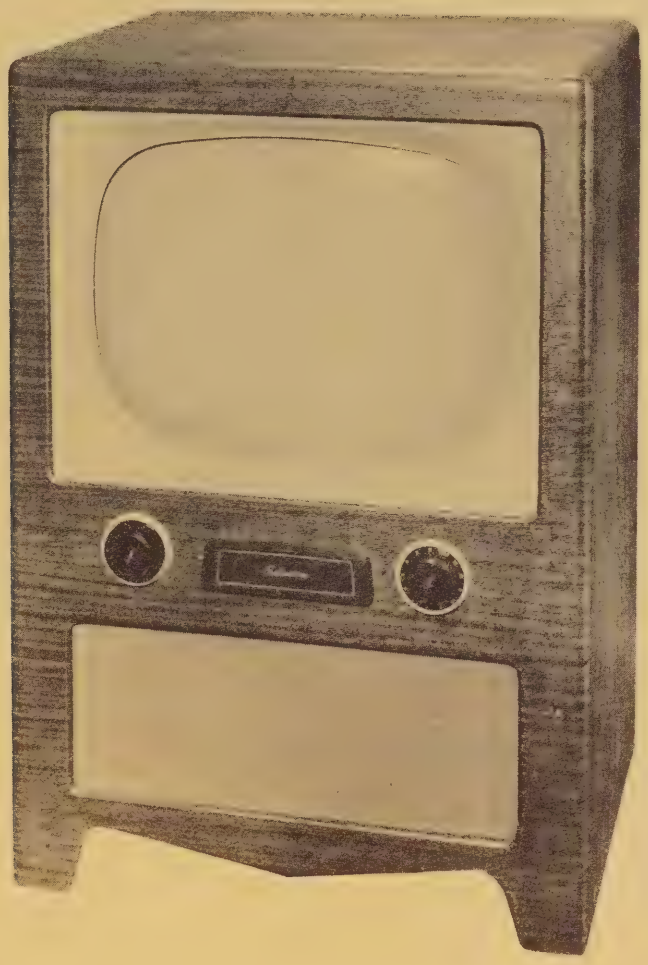

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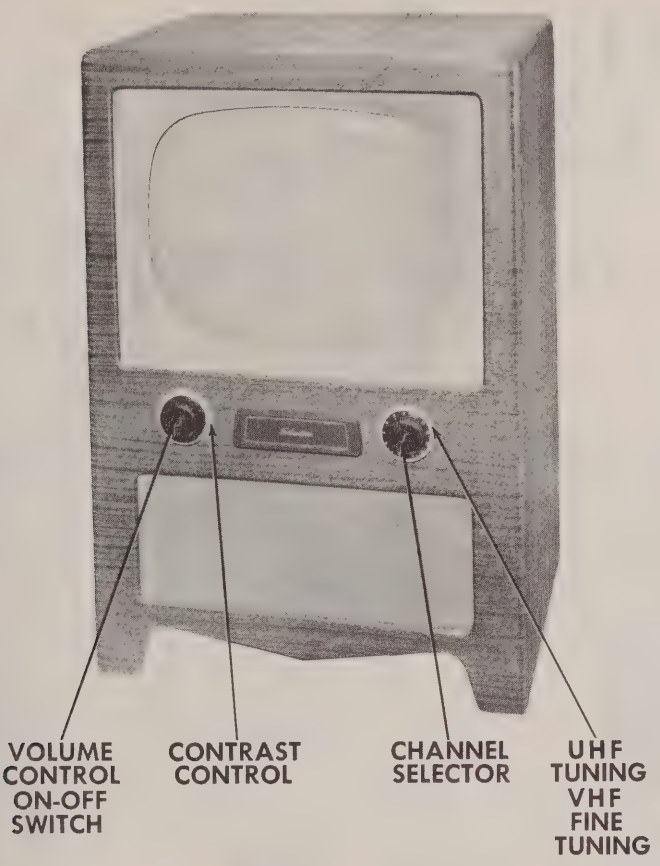

SILVERTONE 4127A (Ch. 528.268)

TRADE NAME	Silvertone Model 3112C (Ch. 528.258), 4127A (Ch. 528.268)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-two
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.8 Amp. @ 117 Volts AC
TUNING RANGE-	Channels 2 thru 13 VHF, 14 thru 23 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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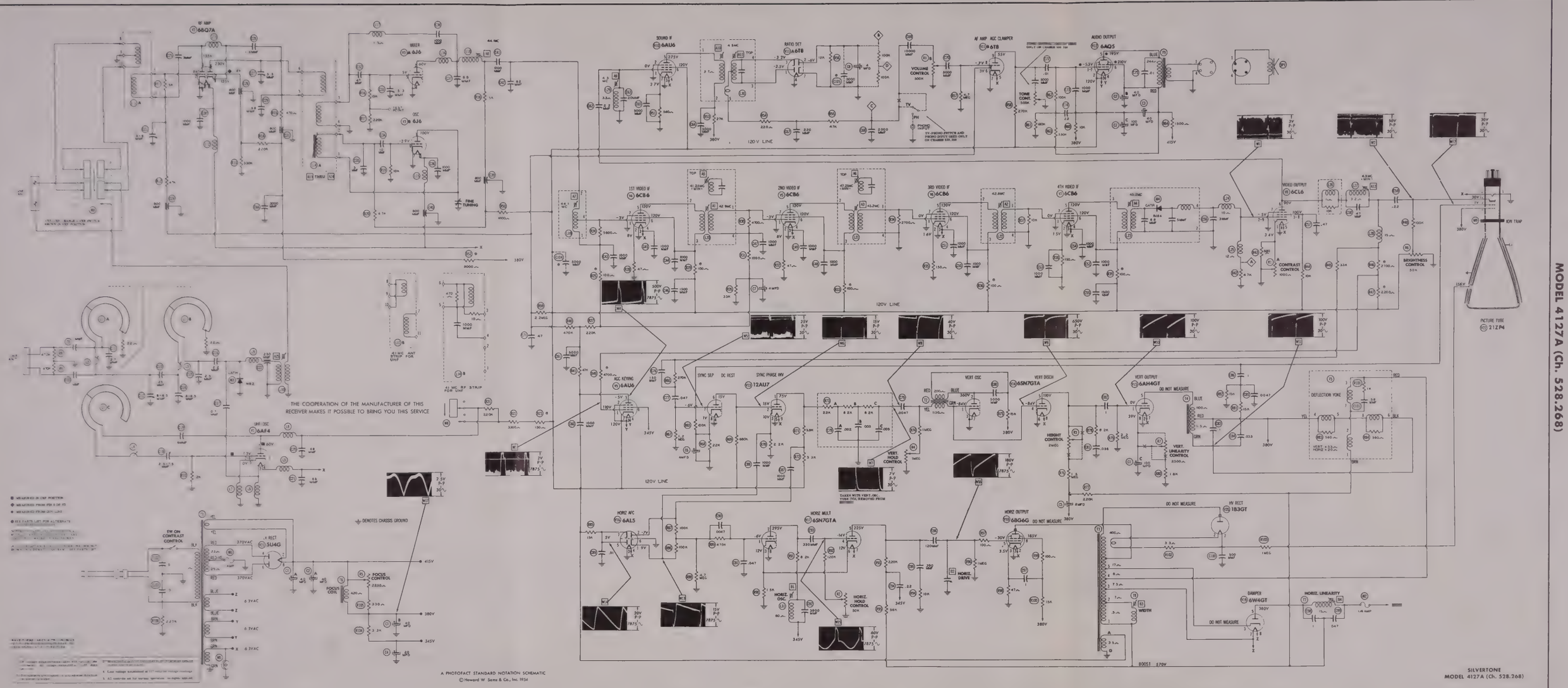
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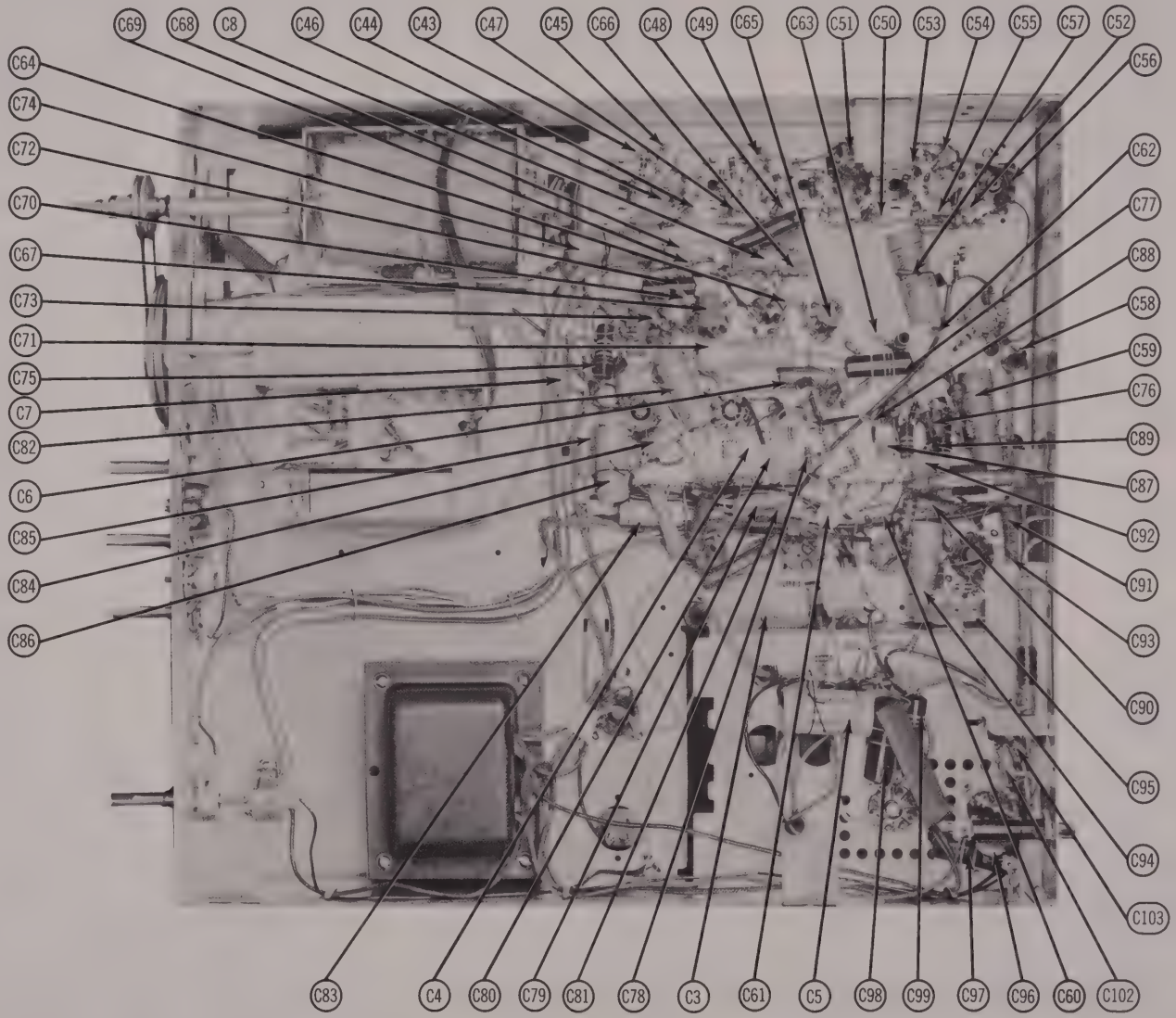
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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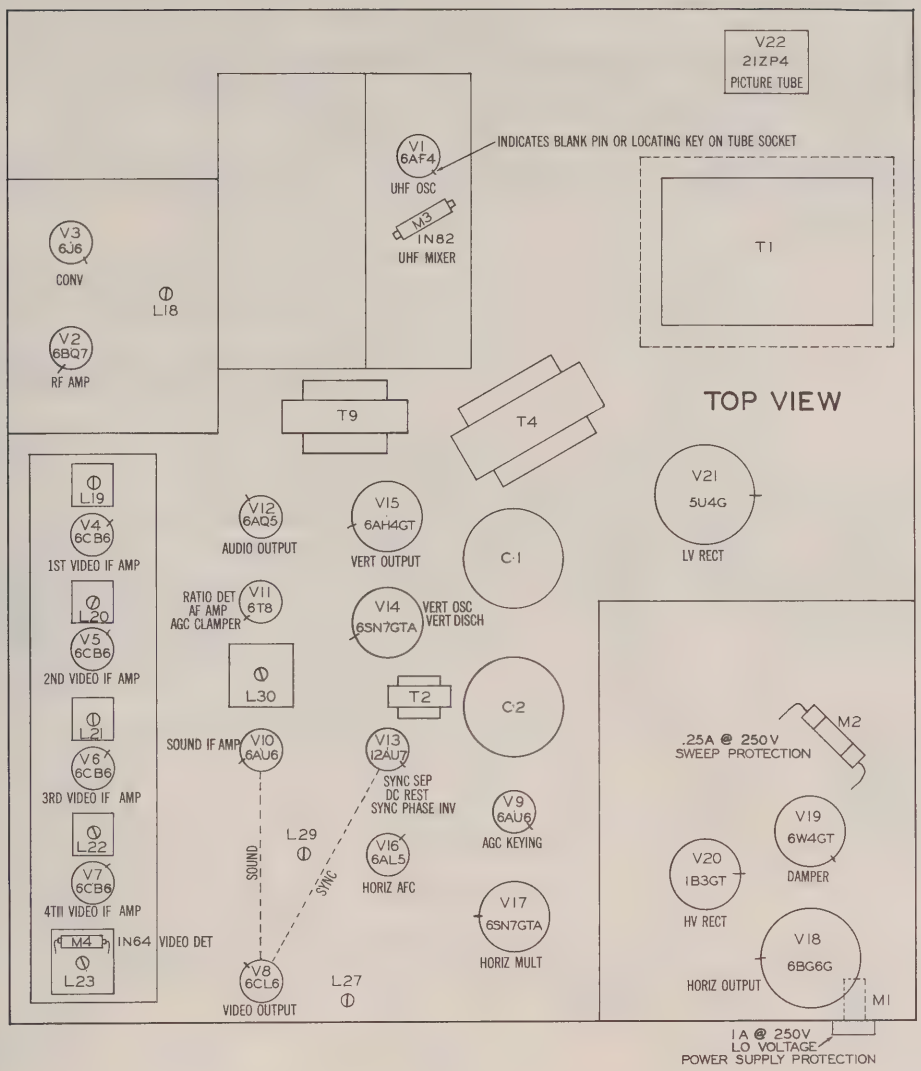
TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V21, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, V8, V12 (V1 UHF only)
No pic, no sound, has snow - V2, V4, V5
No pic, has sound, has raster - V8, V22
Has pic, no sound - V10, V11, V12
Overloaded picture - V9, V11

SYNC FAILURE
No vert. sync - V13, V14
No horiz. sync - V13, V16, V17
No vert. or horiz. sync - V13

SWEEP FAILURE
No raster, has sound - V17, V18, V19, V20, V22, Fuse (M2)
No vertical deflection - V14, V15
Poor vert. linearity or foldover - V14, V15
Poor horiz. linearity or foldover - V17, V18, V19
Narrow picture - V17, V18, V19, V20, V21
Vert. off freq. - V13, V14
Horiz. off freq. - V13, V16, V17

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V17) to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to the ungrounded side of C7. Connect the positive lead to chassis. Short antenna terminals to chassis. Remove the converter tube (V3) and replace with a 6J6 which has pin 1 removed. This will disable the local ocillator and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	42.9MC (Unmod)	Any	DC probe to point Ⓐ.	A1, A2	Adjust for maximum deflection. Attenuate generator output to maintain not more than 2.5 volts on VTVM.
2.	"	"	45.2MC	"	"	A3, A4	"
3.	"	"	41.25MC	"	"	A5	Adjust for MINIMUM deflection. Increase generator output to provide useable indication on VTVM.
4.	"	"	47.25MC	"	"	A6	"
5.	"	"	42.9MC	"	"	A1	Adjust for maximum deflection. Attenuate generator output to maintain not more than 2.5 volts on VTVM.
6.	"	"	45.2MC	"	"	A3	"
7.	"	"	44.1MC	"	"	A7, A8	"

OVERALL VIDEO IF RESPONSE CHECK

Attenuate generator output to maintain 2 volts peak to peak on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44MC (10MC Swp)	41.25MC 42.55MC 42.9MC 44.1MC 45.2MC 45.75MC 47.25MC	Any	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, retouch A1 thru A4 and A7 and A8 to obtain desired response. A4 positions 45.75MC marker and A2 affects tilt.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓑ to chassis. The junction of these two resistors is alignment point Ⓓ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A9, A10	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point Ⓒ. Common to point Ⓓ.	All	Adjust for zero reading. A positiv e and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓑ. Low side to chassis.	A9, A10	Disconnect stabilizing capacitor C8. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
10.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	All	Reconnect stabilizing capacitor C8. Adjust so that 4.5MC occurs at center of cross-over lines as in Fig. 3. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.01MFD	High side to pin 11 (cathode) of picture tube. Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A12	Adjust for MINIMUM deflection.

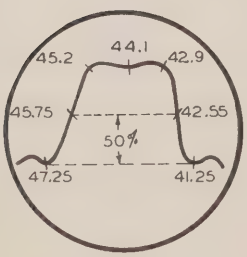

FIG.1

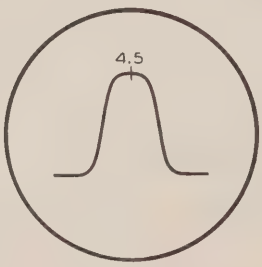

FIG.2

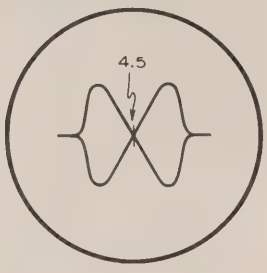

FIG.3

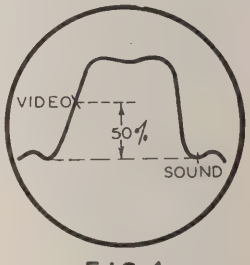

FIG.4

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the bias supply as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across VHF antenna leads with 120Ω in each lead	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

RF AND MIXER ALIGNMENT

The RF and mixer portion of this receiver has been aligned at the factory and is very stable. Alignment of this portion of the receiver should not be required.

ON THE AIR UHF OUTPUT TRANSFORMER ALIGNMENT

Switch the channel knob to "UHF" position.
Tune in a local UHF station and adjust A25 for clearest picture and best sound.
Further adjustments of the UHF tuner are not recommended in the field.

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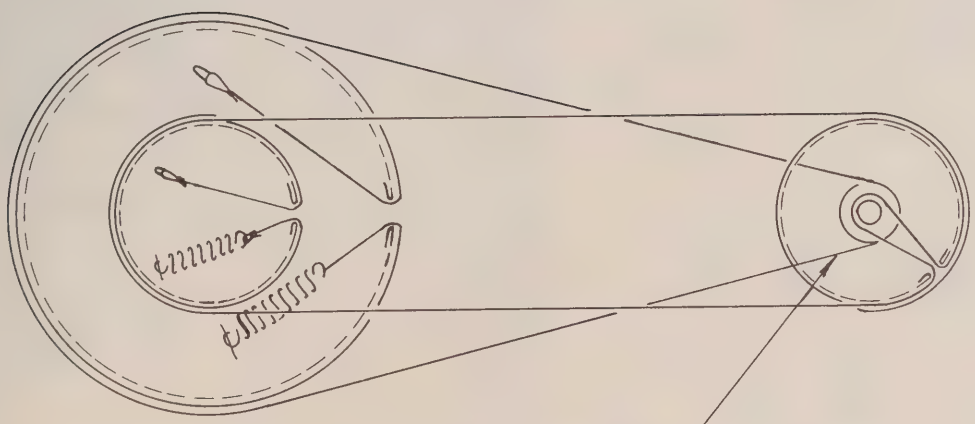
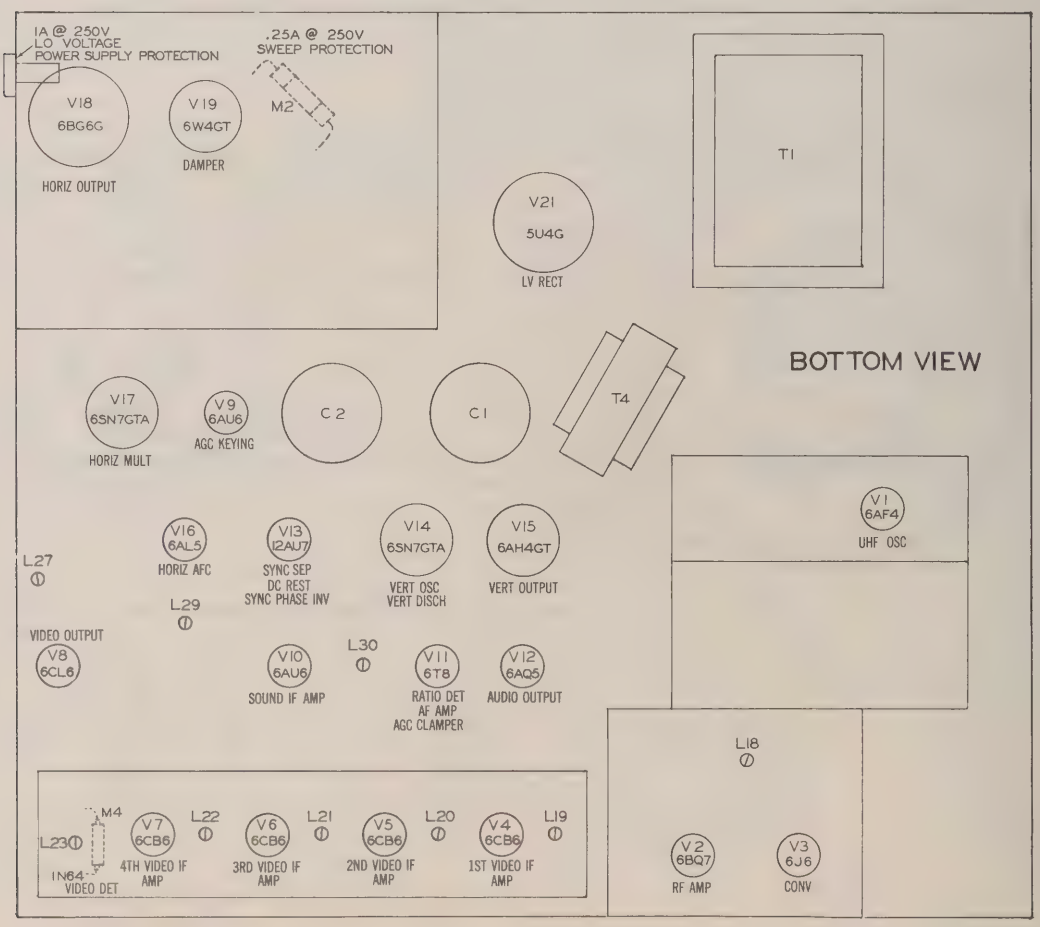


UHF DRIVE CORD STRINGING

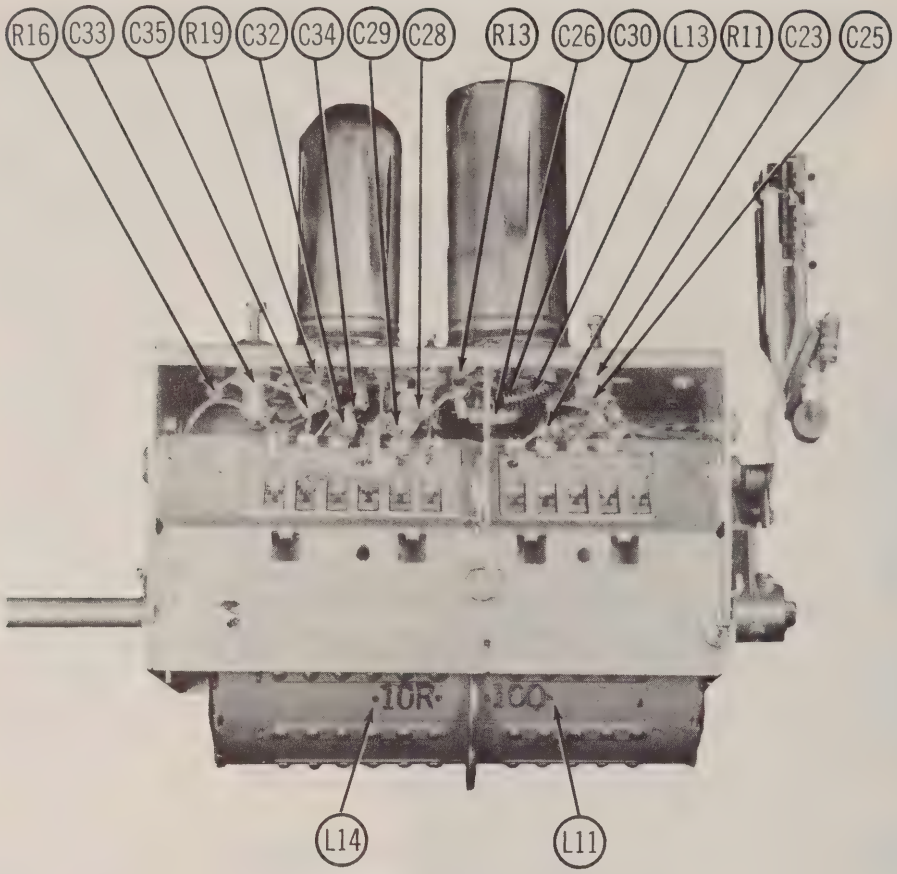
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†■3.4KΩ	12KΩ	0Ω	.1Ω	0Ω	12KΩ	†■3.4KΩ		
V 2	6BQ7A	INF	650KΩ	0Ω	.1Ω	0Ω	▲9KΩ	160KΩ	INF	0Ω
V 3	6J6	†5.7KΩ	†16KΩ	.1Ω	0Ω	235KΩ	10KΩ	0Ω		
V 4	6CB6	33KΩ	47Ω	0Ω	.1Ω	†100Ω	†100Ω			
V 5	6CB6	34KΩ	47Ω	0Ω	.1Ω	†100Ω	†100Ω			
V 6	6CB6	.1Ω	150Ω	0Ω	.1Ω	†100Ω	†100Ω			
V 7	6CB6	.1Ω	150Ω	0Ω	.1Ω	†100Ω	†100Ω			
V 8	6CL6	450Ω	4.7KΩ	†10KΩ	0Ω	.1Ω	†4.9KΩ	0Ω	†10KΩ	4.7KΩ
V 9	6AU6	†6.9KΩ	†0Ω	†0Ω	†.1Ω	300KΩ	▲3.8KΩ	†0Ω		
V 10	6AU6	3.3Ω	0Ω	0Ω	.1Ω	▲27.5KΩ	†0Ω	560Ω		
V 11	6T8	INF	12KΩ	INF	0Ω	.1Ω	600KΩ	0Ω	4.7Meg	†270KΩ
V 12	6AQ5	240KΩ	▲10.5KΩ	†0Ω	†.1Ω	▲1.7KΩ	▲1.5KΩ	240KΩ		
V 13	12AU7	†7.2KΩ	†680KΩ	2.2KΩ	0Ω	0Ω	†680KΩ	1.2Meg	22KΩ	.1Ω
V 14	6SN7GT	1.7Meg	▲15.5KΩ	0Ω	1.7Meg	◓2.8Meg	0Ω	0Ω	.1Ω	
V 15	6AH4GT	2.2Meg	0Ω	30KΩ	22KΩ	▲1.5KΩ	15KΩ	.1Ω	2.7KΩ	
V 16	6AL5	4.8Meg	4.8Meg	0Ω	.1Ω	15KΩ	0Ω	15KΩ		
V 17	6SN7GT	5.2Meg	▲12KΩ	1.5KΩ	160KΩ	◓275KΩ	1.5KΩ	.1Ω	0Ω	
V 18	6BG6G	INF	.1Ω	47Ω	◓275KΩ	1Meg	▲15.5KΩ	0Ω	▲15.5KΩ	TOP CAP ◓17Ω
V 19	6W4GT	INF	INF	5Meg	INF	▲350Ω	▲345Ω	▲15Ω	◓15Ω	
V 20	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ◓417Ω
V 21	5U4G	INF	45KΩ	INF	26Ω	INF	28Ω	INF	45KΩ	
V 22	21ZP4	0Ω	122KΩ	PIN 10 ▲330Ω	PIN 11 †150KΩ	PIN 12 .1Ω				

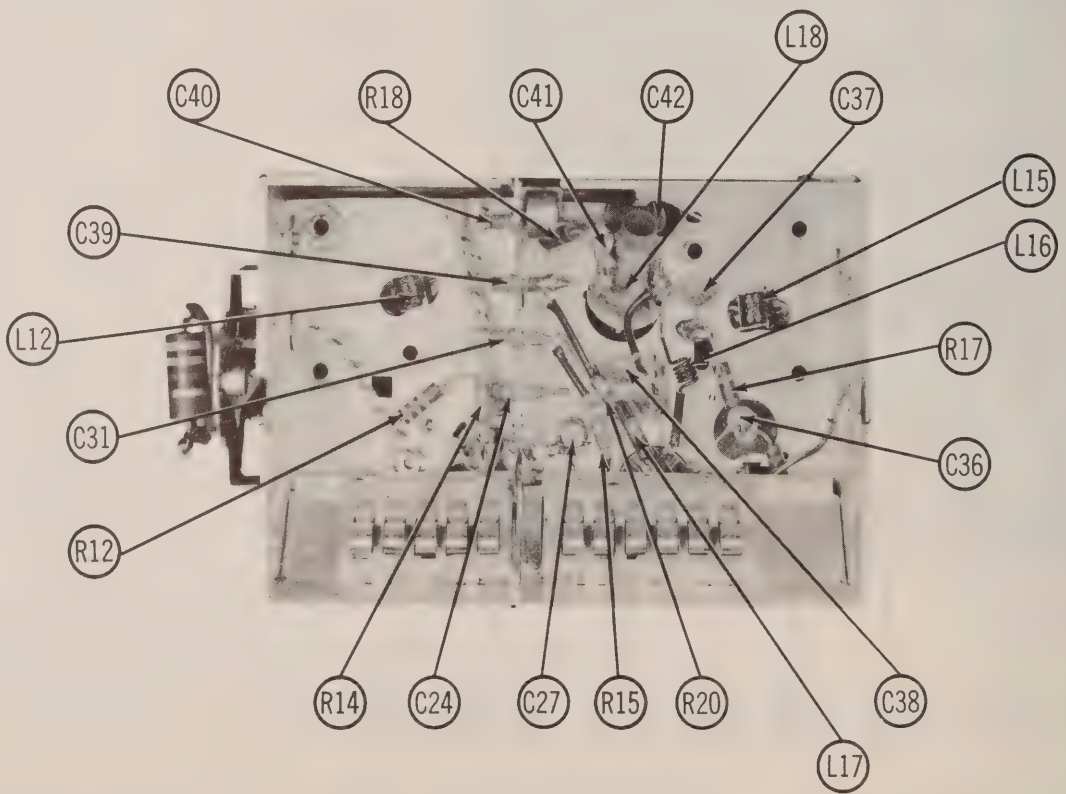
■ MEASURED IN UHF POSITION
† MEASURED FROM PIN 2 OF V12
▲ MEASURED FROM PIN 8 OF V21
◓ MEASURED FROM PIN 3 OF V19



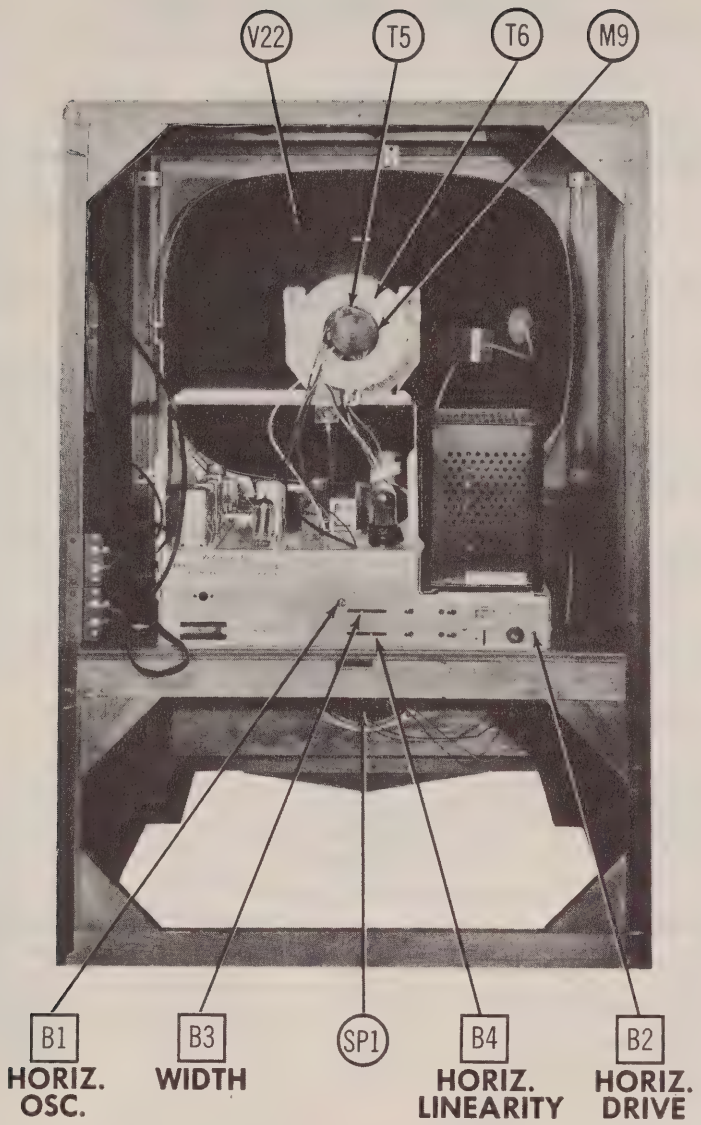
TUBE PLACEMENT CHART



VHF TUNER-RIGHT SIDE



VHF TUNER-BOTTOM VIEW



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3924 MEADE ST.
DENVER, COLORADO

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to its mid-range position and adjust the horizontal oscillator slug (B1) until the picture synchronizes horizontally. Momentarily remove the signal by switching off channel and back again. If picture does not fall in sync slightly retouch B1. Repeat procedure until picture falls in sync after momentary removal of signal.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the width coil slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V17, V18, V19 and V21. Check adjustments B2, B3 and B4. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check C99, R98, T7, T8, T3 and T5A and other associated components.	Check C96, C93, R96, R97, and associated circuit components.

DRIVE LINES

Check adjustment B2, B4. Check by substitution V18 and V19. Check C98, T8, T3, T5A, R96, and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V18 and V19. Check components associated with horizontal output and damper stages especially T3, T5A for failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V17 and V18. Check associated circuit components.

XMAS TREE EFFECT

Check by substitution V17 and V18. Check R91, R89, C92, C93, L31 and other associated circuit components for failure or change of value.

VERTICAL

LOSS OF SWEEP

Check by substitution V14 and V15. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B and other associated components.	Check T2, R3A, R76, R75 and other circuit components.

COMPRESSED AT BOTTOM

Check by substitution V14. Check C81, C5, R3A, T4, T5B and other other associated circuit components for failure or change of value.

COMPRESSED AT TOP

Check by substitution V15. Check C1C, R-7A, R80 and other associated circuit components.

FOLDS

Check by substitution V14 and V15. Check components associated with V14 and V15 for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V13. Check C77, C76, R68, R69, and other associated circuit components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V13 and V14. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check C79, C81, R74, R4A and other associated circuit components.	Check C78A, B, C, R71 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V16 and V17. Check waveform W13.

If Satisfactory	If Unsatisfactory
Check C91, C92, C93, R89 and other associated components.	Check R87, R88, R85, C88, C87, C89 and other associated circuit components for failure or change of value.

HORIZONTAL BENDING

Check by substitution V13, V16, V17 and V18. Check horizontal AFC filter network (C91, C90, R89, R88, R87 for failure or change of value.

VIDEO

LOSS OF VIDEO

Check C59, L26 and other associated components.

SOUND BARS (4.5MC BEAT)

Check fine tuning adjustment. Check adjustment A12. Check video IF alignment.

POOR CONTRAST

Substitute V8. Check video detector crystal and assembly. Check picture tube and other associated circuit components.

NEGATIVE PIX

Check by substitution V8. Check video detector assembly. Check picture tube. Check AGC network for proper operation.

SMEAR

Check by substitution V8. Check video detector crystal and assembly. Check L25, L28, R46, R47, R42, picture tube and other associated circuit components.

WIDE BLACK BAR ACROSS PIX

Check V4, V5, V6, V7 and V8 for heater to cathode leakage. Check V1, V2, V3 in tuner assembly.

AUDIO

WEAK OR NO SOUND

Check by substitution V10, V11 and V12. Check components associated with these stages especially R53, R58, R61, R62, C72, C70, T9 and speaker.

BUZZ

Adjust buzz control for minimum buzz. Check adjustment A11. Substitute V11. Check C8, R56, R54, R55 and other associated circuit components for failure or cahge of value.

DISTORTED

Follow procedure outlined in "Weak or No Sound".

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	RF Amplifier	6BQ7A	6BQ7A	9AJ	
V3	Converter	6J6	6J6	7BF	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	4th. Video IF Amp.	6CB6	6CB6	7CM	
V8	Video Output	6CL6	6CL6	6CL6	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Detector-AF Amp.-AGC Clamper	6T8	6T8	9E	
V12	Audio Output	6AQ5	6AQ5	7BZ	
V13	Sync Separator-DC Restorer-Sync Phase Inv.	12AU7	12AU7	9A	
V14	Vert. Osc. - Vert. Discharge	6SN7GTA	6SN7GTA	8BD	
V15	Vert. Output	6AH4GT	6AH4GT	8EL	
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V18	Horiz. Output	6BG6G	6BG6G	5BT	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5U4G	5U4G	5T	

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DENVER, COLORADO

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	SILVERTONE PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V22	21ZP4	21ZP4A ①	21ZP4B ①	21ZP4 21ZP4A① 21ZP4B①	21ZP4A ① 21ZP4B ①	12D 12N	① Circuit changes necessary.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲40	450	T18-295	AFH3-159		C118		FP375	TVL-3764	
B	■40	450								
C	▲100	200								
C2A	▲40	450	T18-295	AFH3-159		C118		FP375	TVL-3764	
B	■40	450								
C	▲100	200								
C3	40	400	T18-308	PRS450/40		BR4045		TC78	TVA-1712	
C4	20	450	T18-276	PRS450/20		BR2045		TC75	TVA-1709	
C5	8	500	T18-298	PRS500/8		BR850		TC82	TVA-1902	
C6	4	50	T18-292	PRS150/4		BR550		TC30	TVA-1303	
C7	4	50	T18-292	PRS150/4		BR550		TC30	TVA-1303	
C8	4	50	T18-292	PRS150/4		BR550		TC30	TVA-1303	
C9	1			S1lNP0	TCZ-1	TZ03	NP0K-010		5TCCB-V1	
C10	1			S1lNP0	TCZ-1	TZ03	NP0K-010		5TCCB-V1	
C11	2.7									
C12	.8-6.5									
C13	.25									
C14	.8-6.5									
C15	2.5									
C16	2.2			SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C17	.7				TCZ-.68	TZ02	NP0K-R68			
C18	2.5-7.5									
C19	6									
C20	68			SI68	D6-680	TP32	GP1K-680	UC-5468	5GA-Q68	
C21	68			SI68	D6-680	TP32	GP1K-680	UC-5468	5GA-Q68	
C22	250									
C23	3-9				829-10					
C24	800			EF-001	MFT-1000				503C-D1	
C25	3			SI3.3NP0	TCZ-3	Z007	NP0K-030	ZT-5533	5TCCB-V33	
C26	800			EF-001	MFT-1000				503C-D1	
C27	.5-3				829-3		3115-01-0R5	CT565A		
C28	1.5			SIL.5NP0	TCZ-1.5	Z004	NP0K-1R5	ZT-5515	5TCCB-V15	
C29	68			SI68	D6-680	G038	811-680	UC-5468	5GA-Q68	
C30	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31	800			EF-001	MFT-1000				503C-D1	
C32	47			BPD-000047	D6-470	G033		UC-5447	5GA-Q47	
C33	.5-3				829-3		3115-01-0R5	CT565A		
C34	10			SI10NP0	TCZ-10	Z018	NP0K-100	ZT-541	5TCC-Q1	
C35	5									
C36	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C37	6.8			SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C38	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	800			EF-001	MFT-1000				503C-D1	
C40	800			EF-001	MFT-1000				503C-D1	
C41	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C42	82					TN20	N750L-820			
C43	1000		T15-247	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C44	1000		T15-247	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C45	1000		T15-247	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C46	1500		T16-241	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C47	1000		T15-247	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C48	1000		T15-247	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C49	1000		T15-247	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C50	1000		T15-247	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C51	1000		T15-247	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C52	1000		T15-247	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C53	1000		T15-247	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C54	1000		T15-247	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C55	1500		T16-241	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C56	3		T15-249	SI3.3NP0	TCZ-3	Z007	NP0K-030	ZT-5533	5TCCB-V33	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C57	.47	400	T6-246	P488-47		CUB4P47		PT4047	4TM-P47	
C58	47			SI47MP0	TCZ-47	T2Z2		T2Z2	5TCC-Q47	
C59	.22	600	T6-218	684-25		CUB6P22	NP0K-470	PT6025	6TM-P22	
C60	1000		T15-220							
C61	5000		T16-177	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C63	2.2			SI2.2NP0	TCZ-2.2	Z006	NP0K-2R2		5TCCB-V22	
C63	20									
C64	5000		T16-177	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C65	5000		T16-177	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C66	5000		T16-177	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C67	220	500	T15-218	1469-00025		22R5T22		MCB240		Note 1
C68	2000		T15-230	BPD-002	DD-202	K072	80L-002	DC-522	5HK-D2	
C69	10000		T15-211	BPD-011	DD-103	K082	81L-01	DC-511	5HK-S1	
C70	5000		T16-177	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C71	.47	200	T16-240	P288-47		CUB2P47		PT4047	2TM-P47	
C72	.01	600	T16-237	P488-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C73	1000		T15-220	BPD-001	DD-102	K069	80L-001	DC-521	5HK-D1	
C74	.22	600	T16-218	684-25		CUB6P22		PT6025	6TM-P22	
C75	.01	600	T16-237	P488-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C76	150	500	T15-235	1468-00015	D6-151	5W5T15	GP2K-151	MC238	1FM-315	
C77	.047	600	T16-235	P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C78A	.002							PT6252		
B	.005		sT1T-109	sPA-120	sPC-100	sLI5TM1	s1408-01	PT6325	sV-1	
C	.005							PT625		
C79	.0047	600	T16-233	P686-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C80	5000		T16-177	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C81	.056	600	T16-236			PM6S56				
C82	.1	600	T16-238	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C83	.1	400	T15-197	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C84	.033	600	T16-234	P688-033		CUB6S33		PT6133	6TM-S33	
C85	.0047	600	T16-233	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C86	.1	600	T16-238	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C87	1000		T15-220	BPD-001	DD-102	K069	80L-001	DC-521	5HK-D1	
C88	1000		T15-220	BPD-001	DD-102	K069	80L-001	DC-521	5HK-D1	
C89	.01	600	T16-237	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C90	.0047	600	T16-233	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C91	.047	400	T16-245	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C92	3900	500		1464-004		IR5D39		MCE463	MS-24	
C93	330	500	T15-228	1469-00035		5R5T33			MS-24	
C94	.22	600	T16-218	684-25		CUB6P22		PT6025	6TM-P22	
C95	390	500	T15-231	1469-0004		5R5T39			MS-24	
C96	120		T15-232	BPD-00012	D6-121	K044	GP2K-121	UC-5312	5GA-T12	
C97	.1	600	T16-238	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C98	.1	600	T16-238	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C99	.047	600	T16-235	P688-047		CUB6S47		PT6147	6TM-S47	
C100	600	10000	T15-239	HV20C	TV3-502	MMU30T75	413	HV30035A	20DK-T5	
C101	56	2000					3KV-560		30GA-X56	
C102	.01	600	T16-237	6892X-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C103	.01	600	T16-237	6892X-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C104	5000		T16-177	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	Note 2
C105	5000		T16-177	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	Note 3

s Items C78A, C78B, C78C, R73A, R73B, R73C are combined in one unit.
Note 1. Early production of 528.258 chassis use 270MMF in this application (part #T15-258).
Note 2. Used in chassis 528.258 only.
Note 3. Not used in all models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No	INSTALLATION NOTES
R1A	1000Ω	½	24-306	* QJ-482	HTV-282		UF1L	Contrast (Panel)
B	500KΩ	½					UR15A	Volume (Rear)
C	Switch	½					US-26	Attach to R1A
R2A	50KΩ	½	A25-21	QU-123	A47-50K-S	AB-31	U-35	Horiz. Hold-Note 1
B	Shaft	½	Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	2 Meg	½	25-15	QU-139	A47-2 Meg-S	AB-75	SU-56	Height
B	Shaft	½	Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	1 Meg	½	25-23	QU-137	A47-1 Meg-S	AB-69	U-54	Vert. Hold - Note 1
B	Shaft	½	Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A
R5A	2250Ω	2	A25-14	WK-2500	A43-2500	VK-132	R2500L	Focus
B	Shaft	½	Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R5A
R6A	50KΩ	½	A25-21	QU-123	A47-50K-S	AB-31	U-35	Brightness
B	Shaft	½	Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R6A
R7A	2500Ω	½	A25-13	QU-112	A47-3000-S	AB-7	U-8	Vert. Linearity
B	Shaft	½	Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A

* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS Bi7-108 & P1-200 (Panel)
Bi3-133 & Ri-223 (Rear) & SWITCH 76-1.
Note 1. Chassis 528.258 uses dual control (Part # T25-24) in this application.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	IRC PART No.	NOTES
R8	470KΩ	½		BTS-470K	
R9	470KΩ	½		BTS-470K	
R10	12KΩ	½		BTS-12K	Note 1
R11	15KΩ	½		BTS-15K	
R12	47KΩ	½		BTS-47K	
R13	330KΩ	½		BTS-330K	
R14	220KΩ	½		BTS-220K	Note 1
R15	470Ω	½		BTS-470	
R16	15KΩ	½		BTS-15K	
R17	220KΩ	½		BTS-220K	Note 1
R18	15KΩ	½		BTS-15K	
R19	10KΩ	½		BTS-10K	
R20	4700Ω	½		BTS-4700	Note 1
R21	220K	½	T60-672	BTS-220K	
R22	3300Ω	2	T60-816	BTB-3300	
R23	150Ω	½	T60-767	BTS-150	Note 6
R24	5600Ω	½	T60-810	BTS-5600	
R25	100Ω	½	T60-752	BTS-100	Note 1
R26	33KΩ	½	T60-748	BTS-33K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	IRC PART No.	NOTES
R46	2700Ω	2	T60-914		Note 3
R47	2200Ω	2	T60-905		Note 4
R48	100KΩ	½	T60-801	BTS-100K	
R49	4700Ω	½	T60-759	BTS-4700	Note 5
R50	1000Ω	½	T60-703	BTS-1000	
R51	560Ω	½	T60-758	BTS-560	
R52	8000Ω 5%	5			Note 2
R53	27KΩ	1	T60-692	BTA-27K	
R54	220Ω	½	T60-753	BTS-220K	
R55	47KΩ	½	T60-730	BTS-47K	
R56	12KΩ	½	T60-811	BTS-12K	
R57	4.7 Meg	½	T60-904	BTS-4.7Meg	
R58	270KΩ	½	T60-747	BTS-270K	
R59	2.2 Meg	½	T60-896	BTS-2.2 Meg	
R60	10KΩ	10	T60-916	1 3/4A-10K	
R61	180KΩ 5%	½	T60-788	BTS-180K 5%	
R62	100KΩ	½	T60-801	BTS-100K	
R63	330KΩ 5%	½	T60-787	BTS-330K 5%	
R64	1500Ω	10	T60-915	1 3/4A-1500	
R65	100KΩ	½	T60-801	BTS-100K	
R66	270KΩ	½	T60-747	BTS-270K	
R67	1.2 Meg	½	T60-782	BTS-1.2 Meg	
R68	22KΩ	½	T60-744	BTS-22K	
R69	680KΩ	½	T60-807	BTS-680K	
R70	2200Ω	½	T60-714	BTS-2200	
R71	1000Ω	½	T60-710	BTS-1000	
R72	3300Ω	½	T60-882	BTS-3300	
R73A	22KΩ	½		BTS-22K	
B	8200Ω	½	s T17-109	BTS-8200	
C	8200Ω	½		BTS-8200	
R74	1 Meg	½	T60-908	BTS-1 Meg	
R75	15KΩ	½	T60-783	BTS-15K	

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	IRC PART No.	NOTES
R76	1.5 Meg	½	T60-880	BTS-1.5 Meg	
R77	220KΩ	½	T60-672	BTS-220K	
R78	8200Ω	½	T60-778	BTS-8200	
R79	2.2 Meg	½	T60-898	BTS-2.2 Meg	
R80	1800Ω	1	T60-899	BTA-1800	
R81	15KΩ	½	T60-783	BTS-15K	
R82	15KΩ	½	T60-783	BTS-15K	
R83	560Ω	½		BTS-560	
R84	560Ω	½		BTS-560	
R85	15KΩ	2	T60-901	BTS-15K	
R86	100KΩ	½	T60-801	BTS-100K	
R87	100KΩ	½	T60-801	BTS-100K	
R88	4.7 Meg	½	T60-904	BTS-4.7 Meg	
R89	470KΩ	½	T60-902	BTS-470K	
R90	1500Ω	½	T60-729	BTS-1500	
R91	8200Ω	½	T60-778	BTS-8200	
R92	120KΩ	½	T60-817	BTS-120K	
R93	220KΩ	1	T60-886	BTA-220K	
R94	10KΩ	½	T60-780	BTS-10K	
R95	56KΩ	½	T60-802	BTS-56K	
R96	1 Meg	½	T60-909	BTS-1 Meg	
R97	1000	2	T60-752	BTS-100	
R98	47Ω	1	T60-805		
R99	100Ω	½	T60-752	BTS-100	
R100	15KΩ	5	T60-804	BS/4A-15K	
R101	1000Ω	½	T60-703	BTS-1000	
R102	3.3Ω	½	T60-884		
R103	1 Meg	1	T60-877	BTA-1 Meg	
R104	3300Ω	2	T60-816	BTB-3300	
R105	330Ω	2	T60-814	BTB-330	
R106	220KΩ	½	T60-672	BTS-220K	

s Items R73A, R73B, R73C, C78A, C78B, C78C are combined in one unit.
Note 1. Some models may use a 1000Ω resistor in this application.
Note 2. Some models may use a 8200Ω resistor in this application
Note 3. Some models may use a 2200Ω resistor in this application.
Note 4. Some models may use a 2700Ω resistor in this application.
Note 5. Some models may use a 39KΩ resistor in this application.
Note 6. Notused in chassis 528.258.

TRANSFORMER (POWER)

ITEM No.	RATING PRI	RATING SEC. 1	RATING SEC. 2	SILVERTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC	750VCT	5VAC	C80-292	P-8169		R-38BC		P9731	
	① 1.8A	.190ADC	② 3A							
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC	6.3VAC	6.3VAC							
	③ 1.2A	④ .73A	⑤ 7.5A							

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	SILVERTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T2	Vert. Osc. Trans.	T80-288	A-8125①	A-3003①	A-97X	209T1 ①	B6702 ①	24A87①
T3	Horiz. Output Trans.	T80-289				222T1 ↑ ④ 212R1		
T4	Vert. Output Trans.	T80-287	A-8123	A-3037	A-102X	222T1	21804	26852
T5A	Yoke-Horiz.(14MH)	T83-776	DY-9A	MDY-72	Y-17-1	21ID3 ·	DY602	Y-7
B	Vert. (43MH)							
T6	Focus Coil	T10-503	FC-11	MF-3	B-470-R		EM701	FC-3
T7	Horiz. Lin. Coil(.6-10MH)	T10-604	WC-8 ⑤	MWC-6 ⑤	WC-12 ③④	21SR1 ⑤		WC-17 ③
		T10-582 ②						
T8	Width Coil (.05-.3MH)	T10-602	WC-1 ③			20IR1 ①		WC-11 ③
		T10-551 ⑤						

① Drill one new mounting hole.
② Alternate horizontal linearity coil.
③ Drill new mounting hole or use original slider and core.
④ Connect to coiled blue and green terminals.
⑤ Alternate width coil.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
Horiz. Output Plate Lead				10		
5				8		
4				6		
3				5		
2				2		
1				3		
A				2		
G				1		
Connect Width Coil Across →	2 & 1			212R1 2 & 1		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	SILVERTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T9	5.1KΩ	3.2Ω	B80-286	A-3849	A-3019	S-5Z	21006	26849	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3.2Ω	T79-398 ①	ST-108 Mod. P6-X	6A I	① Used in Model 4127A
				T79-397 ②	ST-105 Mod. P5-X	5A07	② Used in Model 3112C

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI	DC RES. SEC	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	UHF Ant. Coil	0Ω						
B	UHF Mixer Coil	0Ω						
C	UHF Osc. Coil	0Ω						
L2	UHF Ant. Coil End							
	Inductor	0Ω						
L3	UHF Mixer Coil End							
	Inductor	0Ω						
L4	UHF Osc. Coil End							
	Inductor	0Ω						1.2 Microhenries
L5	Fil. Choke	.2Ω						1.2 Microhenries
L6	Fil. Choke	.2Ω						.38 Microhenry
L7	Cathode Choke	.1Ω						.38 Microhmry
L8	RF Choke	.1Ω						
L9	UHF IF Coupling	0Ω						1.7 Microhenries
L10	UHF IF Output Coil	0Ω	0Ω					
L11A	VHF Ant. Coils	0Ω CT	0Ω					
B	UHF Ant. Strip	0Ω			31M-013-1Q			Used in UHF position only.
L12	Fil. Choke	0Ω						
L13	Neutr.Coil	0Ω						
L14A	VHF RF, Mixer Grid & Osc.Coils	0Ω						
B	UHF RF Strip	0Ω			31M-113-1R			Used in UHF position only
L15	Fil. Choke	0Ω						
L16	RF Choke	0Ω						
L17	Feedback Coil	1.5Ω						
L18	Conv.Plate	0Ω						
L19	1st. Video IF	.1Ω		T10-593				Includes RF Choke(3.4Ω)
L20	2nd. Video IF	.1Ω	.1Ω	T10-594	17-4531 †		6232	Includes trap
L21	3rd. Video IF	.1Ω	.1Ω	T10-595			6233	Includes trap
L22	4th. Video IF	.1Ω	.1Ω	T10-596	17-4531 *		6234	
L23	5th. Video IF	.1Ω	.1Ω	T10-597				Includes 1N64 crystal detector (part #T48-70) & 5 & 5MMF capacitors, & series peaking coils
L24	Series Peaking Coil	10Ω		T10-600	19-3160	TV-184	4644	149 Microhenries
L25	Shunt Peaking Coil	12Ω		T10-601	19-3180	TV-184	6154	194 Microhenries
L26	Series Peaking Coil	11Ω		T10-591	19-3150 ◆	TV-184 ◆	4644 ◆	150 Microhenries, wound on 10KΩ resistor
L27	4.5MC Trap	3.2Ω		T10-581	20-1004	TV-151	1469	Silvertone part number includes C58.
L28	Shunt Peaking Coil	15Ω		T10-590	19-3250	TV-185	6151	269 Microhenries
L29	Sound IF	3.3Ω		T10-587	30-1005	TV-151	1469	
L30	Ratio Det.	3.7Ω	.30CT	T10-552	17-1033 ■	TV-110 ■	1468 ■	Tertiary winding-.85Ω
L31	Horiz.Osc.	60Ω		T10-583	19-1576	TV-163	6210	Silvertone part number includes C62

† Drill mounting holes.
* Drill mounting holes and detune trap winding.
◆ Parallel with 10KΩ resistor.
■ Drill mounting holes.

FUSES

ITEM No.	TYPE	RATING	SILVERTONE PART No. FUSE	SILVERTONE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1A 250V	T43-15	T87-44	312001, (3AG-1A)	341001	AGC1	HKP
M2	3AG P/T	1/4A 250V	T43-13		318.250 (3AG P/T 1/4A)		GJV 1/4	

PROPERTY OF
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DENVER, COLORADO

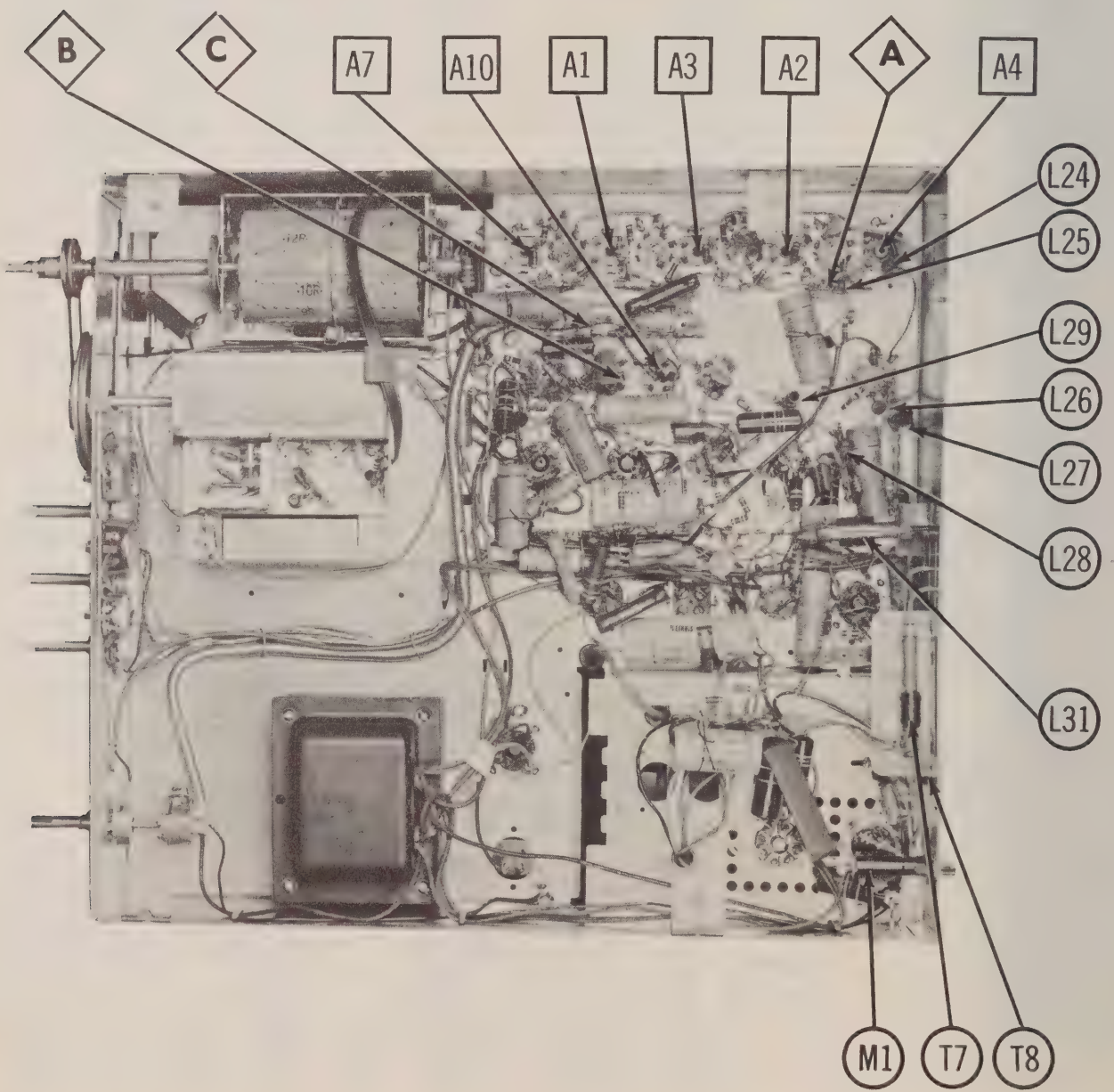
PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SILVERTONE PART No.	SYLVANIA PART No.	FEDERAL PART No.	
M3	1N82		1N82 or 1N82A		UHF Mixer
M4	1N64	T48-70	1N132	1N64A	Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M5	Dial Light	T89-7	#47 Bayonet
M6	Tuner	T95-34	UHF
M7	Tuner	T95-33	VHF
M8	Switch	T69-194	UHF/VHF change-over
M9	Ion Trap	T83-684	
B2	Trimmer Cap.	T20-145	Horiz. Drive
	Cabinet	T42-597	Leatherette Console Model 4127A
	Cabinet	T42-590	Leatherette Table Model 3112C
	Knob	T52-416	Channel with prism
	Knob	T52-417	Contrast Model 3112C only
	Knob	T52-404	Contrast Model 4127A only
	Knob	T52-419	UHF tuning Model 3112C only
	Knob	T52-412	UHF tuning Model 4127A only
	Knob	T52-418	Volume
	Safety Glass	T48-67	



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

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POWER

DEAD SET

If filaments fail to light check AC interlock assembly switch on volume control and T1. If filaments light, substitute V21. Check B+ filter and decoupling network components. Check M1.

SMALL AND/OR DIM PIX

Substitute V21. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check M2 fuse. Substitute V17, V18, V19 and V20. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check T3, T5A, C97, C96, C99, R100, R99 and other associated components.	Check R93, R91, C96, C93 and other associated components for failure or change of value.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V17, V18, V19, V20 and V21. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V18, V19, V20 and V21. Check T3, T5A, C97, C99, picture tube and other associated components.

GENERAL

RASTER SOUND NO PIX

Follow procedure outlined under "Loss of Video".

RASTER NO SOUND NO PIX (VHF)

Check UHF, VHF switch position. Check by substitution V4, V5, V6, V7 and V8. Check associated components.

RASTER NO SOUND NO PIX (UHF)

Check UHF, VHF switch. Check V1, V2 and V3.

NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

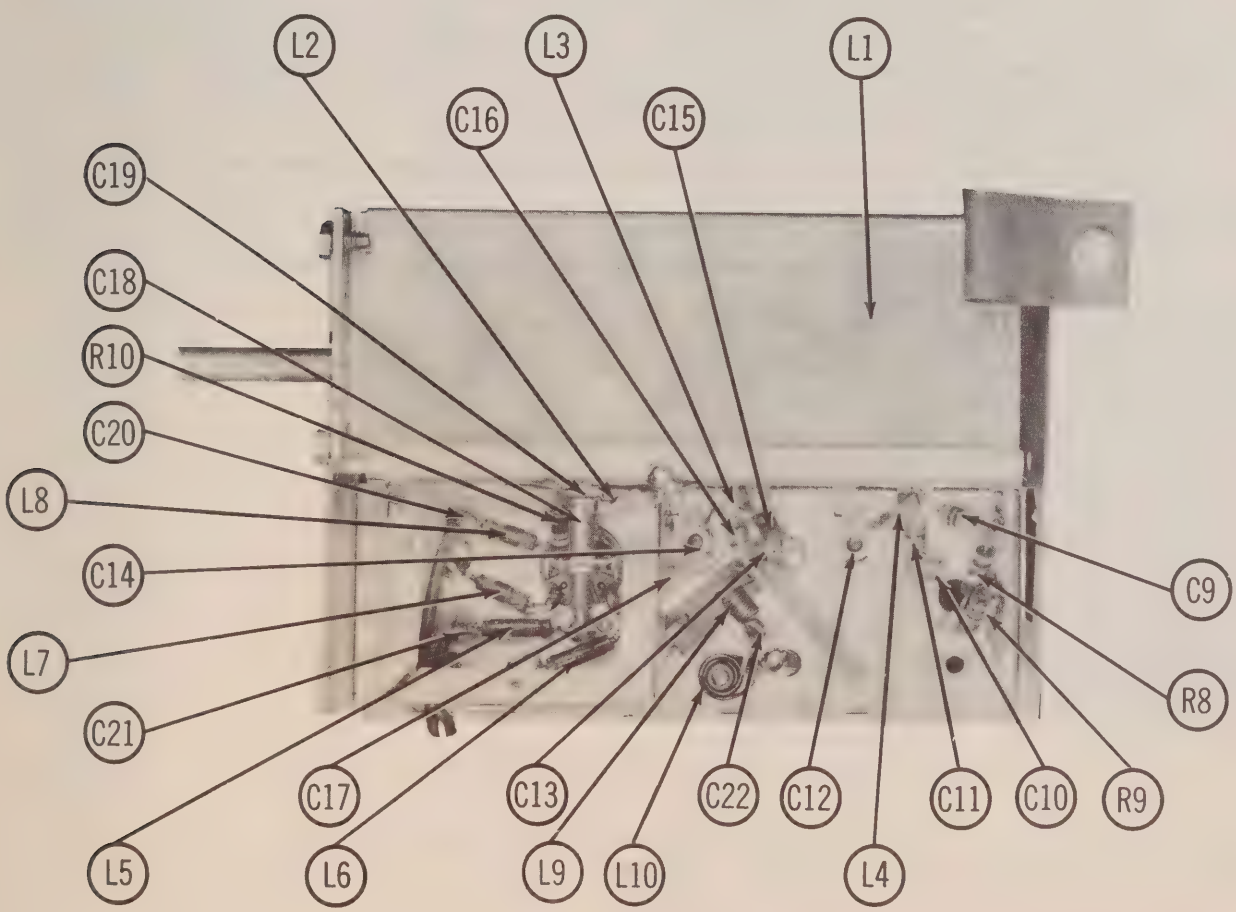
INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing. Check C100 add R103 for internal break down.

KEYSTONE EFFECT

Check T5 deflection yoke and its associated components.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



UHF TUNER BOTTOM VIEW

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

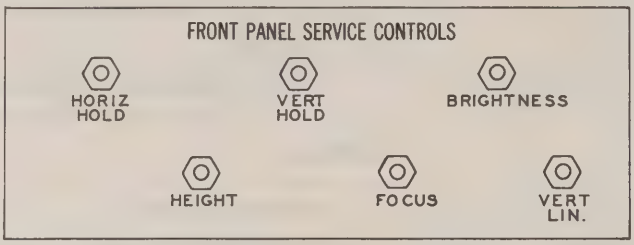
PICTURE TUBE SAFETY GLASS CLEANING

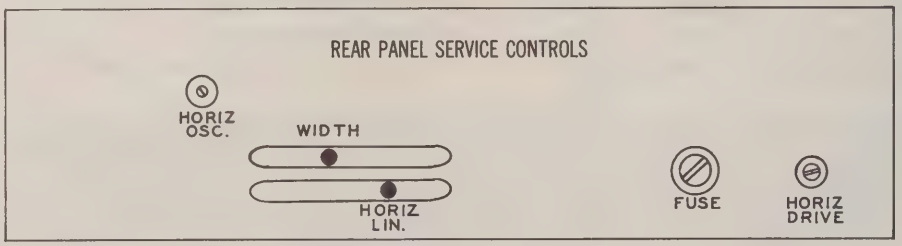
For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal oscillator slug (L31) until the picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L30) located on top of chassis. (See tube placement chart).

FUSES

Two fuses are used. One for horizontal sweep circuit protection and one for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by positioning the focus coil. Adjust the three wing nuts located on the focus coil bracket until picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 5 push-on type control knobs from front panel.
2. Disconnect built-in antenna.
3. Remove 7 wood screws and 1 metal screw. Remove rear cover.
4. Disconnect speaker plug.
5. Remove 4 wood screws. Remove transmission lines from rear of cabinet.
6. Remove 4 chassis bolts. Remove chassis.
7. Remove 4 speaker nuts. Remove speaker.

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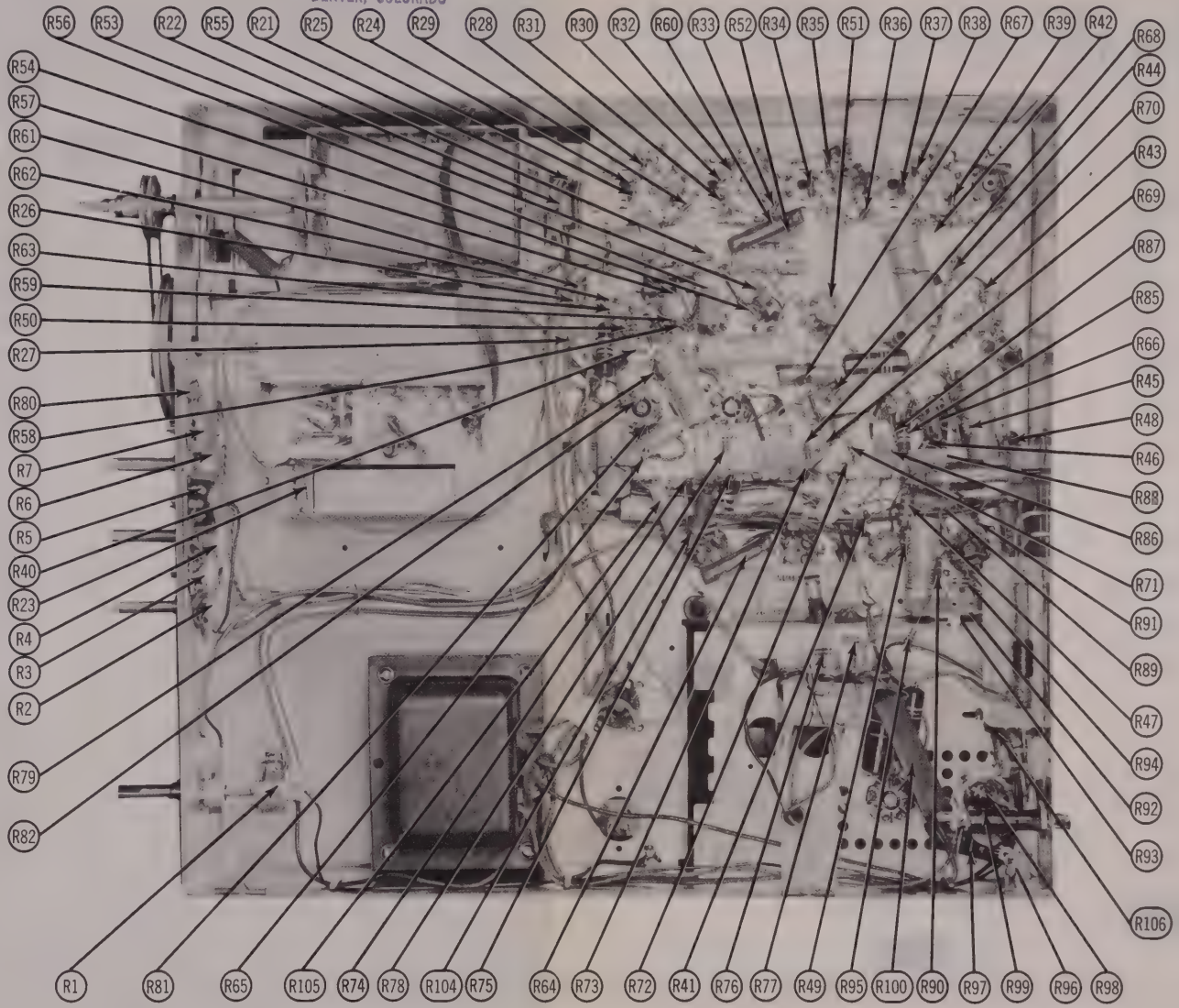


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

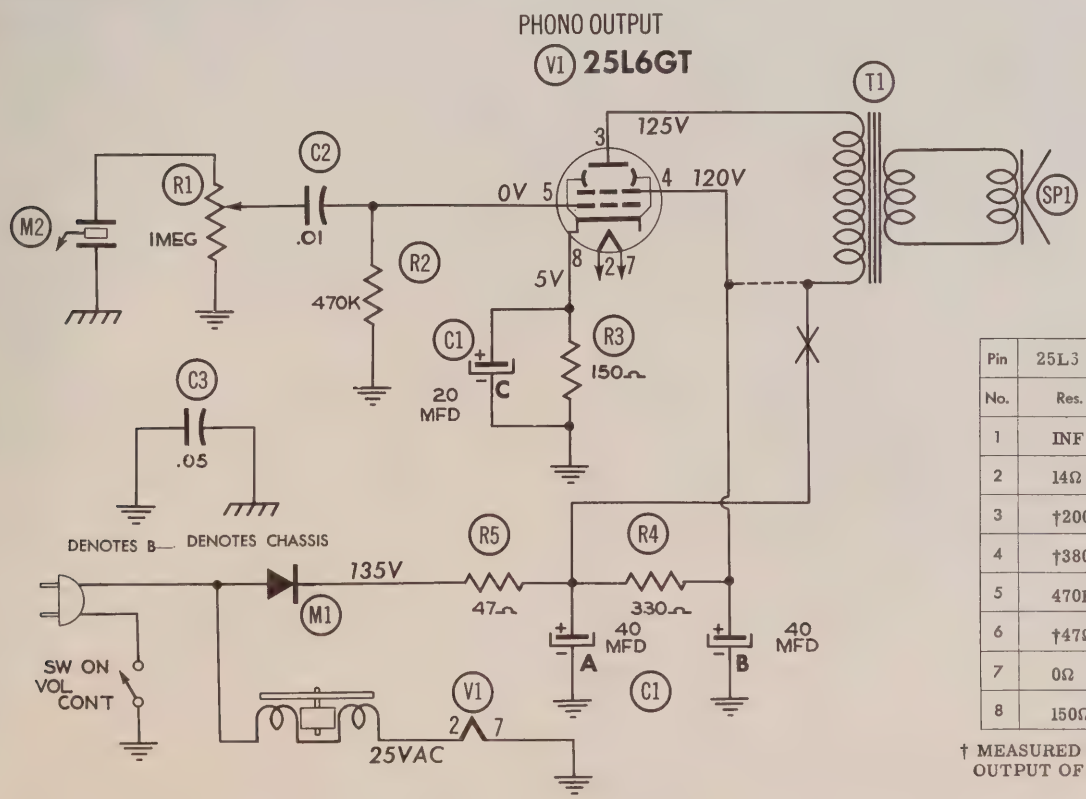
STEELMAN
MODELS BE-20, BE-21, BE-22, 3S2

PROPERTY OF
L. F. [illegible]
[illegible]
DENVER, COLORADO

STEELMAN
MODELS BE-20, BE-21, BE-22, 3S2

STEELMAN MODEL 3S2

TRADE NAME	Steelman Models BE20, BE21, BE22, 3S2
MANUFACTURER	Steelman Radio & Phono Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC Operated Phono Amplifier
TUBES	Type 25L6 Audio Amplifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .37 Amp. @ 117 Volts AC



Pin No.	25L3 Res.
1	INF
2	14Ω
3	†200Ω
4	†380Ω
5	470KΩ
6	†47Ω
7	0Ω
8	150Ω

† MEASURED FROM OUTPUT OF M1.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Output	25L6GT	25L6GT	7S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS150/50-30-20		BBRT44215		3N532	TVA-3448	Red
B	40	150								Blue
C	20	150								Yellow
C2	.01	600		P688-01	D6-103	CUB6S1		PT611	6TM-S5	
C3	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STEELMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	VC-42	Q13-137	A47-1 Meg-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	470KΩ	½		BTS-470K	
R3	150Ω	1		BTA-150	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R4	330Ω	1		BTA-330	
R5	47Ω	1			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: STEELMAN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.3KΩ	3.4Ω		A-3332	A-3025	S-1X ①	Z1101	TS-24S50①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: STEELMAN PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3.4Ω		ST-113 Mod. P4-X	4A1	

SELENIUM RECTIFIER

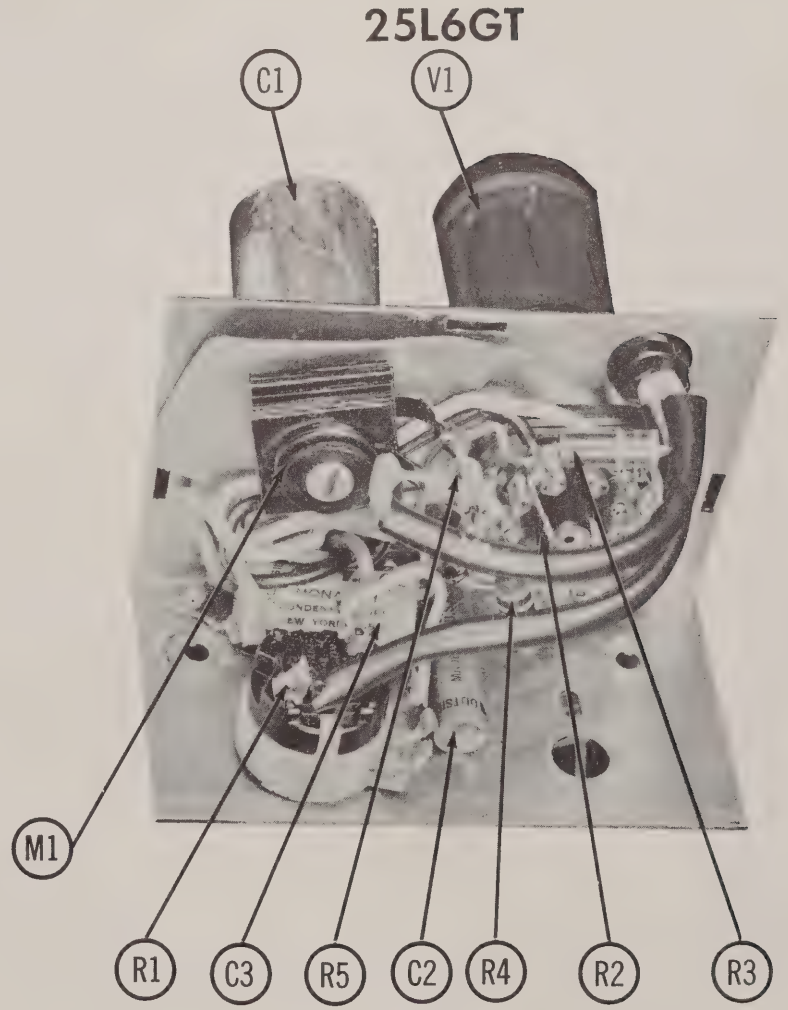
ITEM No.	RATING: CURRENT	REPLACEMENT DATA: STEELMAN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	NOTES
M1	.058A		1002A	RS65	6S65	65	8J1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: STEELMAN PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M2		16L3 *P-29	optional			H60 *2400	optional	* Complete tone arm and cartridge assembly.

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE PLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

CHASSIS—TOP VIEW



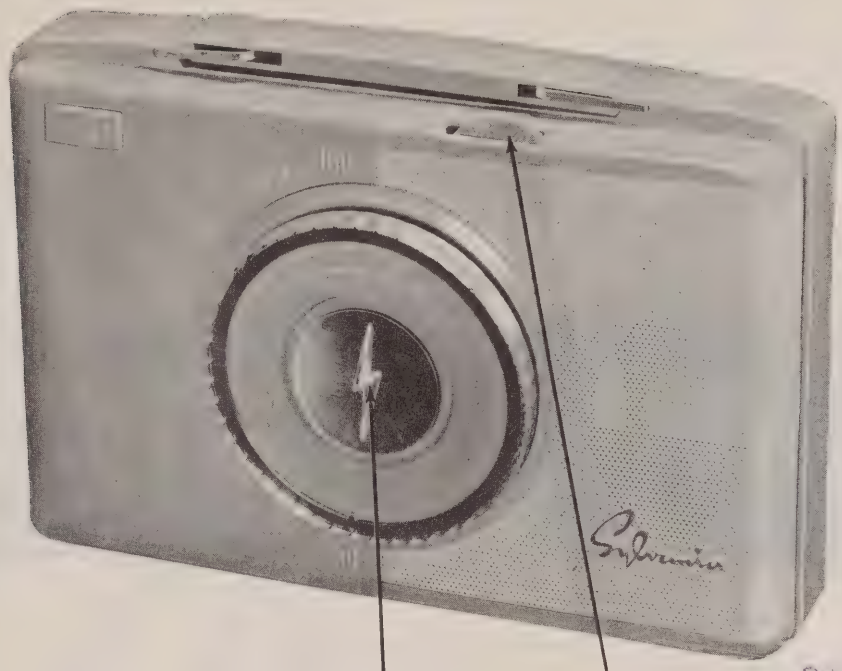
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: STEELMAN PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M3		*J-152 or *J-752	†A-311 ♦A-311D	†WS400-2	Used in Models BE-22 & 3S2 (33 1/3-45-78RPM)
M3		*#10 or *NY-153	*C-427 †C-312 ♦C-312D	†WS-400	Used in Models BE-20 & BE-21 (78 RPM only)

*Metal † Jewel ♦ Diamond

SYLVANIA
MODELS 454BR, GR, H, RE (Ch. 1-606-1)



PROPERTY OF
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3924 MEADE ST.
DENVER, COLORADO

SYLVANIA
MODELS 454BR, GR, H, RE (Ch. 1-606-1)

TRADE NAME	Sylvania Models 454BR, GR, H, RE (Ch. 1-606-1)
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & Tel. Div., 254 Rano St., Buffalo 7, N.Y.
TYPE SET	Battery Operated Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	1.5 Volts "A" Supply & 67.5 Volts "B" Supply
RATING	250MA @ 1½ Volts DC & 8MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1700KC	"	"	A5	Adjust for maximum output. NOTE: this is a preliminary adjustment to locate approximate setting of A5.
3.	"	"	530KC	Tune for max. output	"	A6	Adjust for maximum output. (Preliminary adjustment)
4.		Loop	1450KC	"	"	A5	Adjust for maximum output while rocking tuning gang thru 1450KC signal.
5.		"	600KC	"	"	A6	Adjust for maximum output while rocking tuning gang thru 600KC signal. Repeat steps 4 and 5 until no further improvement is obtained.

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PARTS LIST AND DESCRIPTIONS

SYLVANIA
MODEL 454BR, (Ch. 1-606-1)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	10	70	161-1014			BBR10-70T				
C2	.047	200	162-0215	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	47		163-0047	SI47	D6-470	TP29	GPlK-470	UC-5447	5GA-Q47	
C4	10000		168-0002D	BPD-01	D6-103	K082	811-01	DC-511	5HK-S1	
C5	1000		†190-0011	†PA-186	D6-102	K069	801-001	DC-521	5HK-D1	
C6A	50		*190-0015	*PA-99	*PC-52	*111TM3	*1403-03		*100C3	
B	50									
C7	.0015	600	162-06218	P688-0015	D6-152	CUB6D15	GP2L-152	PT6215	6TM-D15	
C8	.022	200	162-0212	P288-022		PJ2S22		PT4122	2TM-S22	
C9	82		166-0082	SI82	D6-820	TZ28	GPlK-820	UC-5482	5GA-Q82	
C10	.0015	600	162-06218	P688-0015	D6-152	CUB6D15	GP2L-152	PT6215	6TM-D15	
C11	2000		160-2000N	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	

†C5 and R4 are combined in one unit.
* C6A, C6B and R6 are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	2 Meg	½	152-0025					Volume & switch

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R2	100KΩ	½	181-0104	BTS-100K	
R3	15KΩ	½	181-0153	BTS-15K	
R4	3. 3Meg	½	♦190-0011	BTS-3. 3Meg	
R5	3. 3Meg	½	181-0335	BTS-3. 3Meg	
R6	47KΩ	½	* 190-0015	BTS-47K	
R7	1000Ω	½	181-0102	BTS-1000	

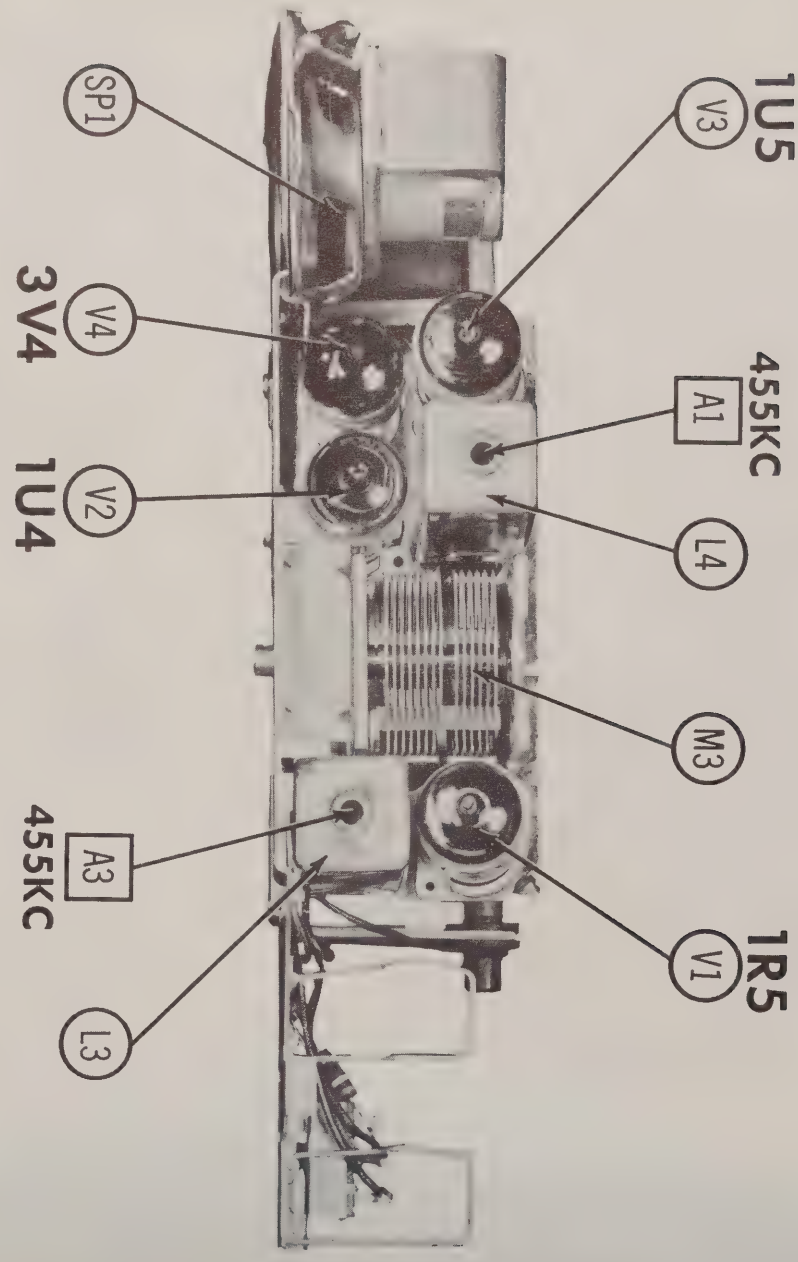
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R8	10 Meg	½	181-0106	BTS-10 Meg	
R9	3. 9 Meg	½	181-0395	BTS-3. 9Meg	
R10	1 Meg	½	181-0105	BTS-1 Meg	
R11	3. 3 Meg	½	181-0335	BTS-3. 3Meg	
R12	390Ω	½	181-0391	BTS-390	
R13	390Ω	½	181-0391	BTS-390	

♦ Items R4 & C5 are combined in one unit.
* R6, C6A, C6B are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SYLVANIA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	10KΩ	16Ω	143-0031						

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	2 x 3"	PM	16Ω	539-2300			

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	1Ω		581-0003				
L2	Osc. Coil	1.5Ω	9.5Ω	113-0028	14-1074		71-Osc.	
L3	Input IF	30Ω	30Ω	122-0022	16-6758	BC-352	12-C1	
L4	Output IF	33Ω	33Ω	122-0024	16-6758 †	BC-353 †	12-C21	Tertiary winding= .4Ω

† Connect Pin 3 of V2 to B+ line.

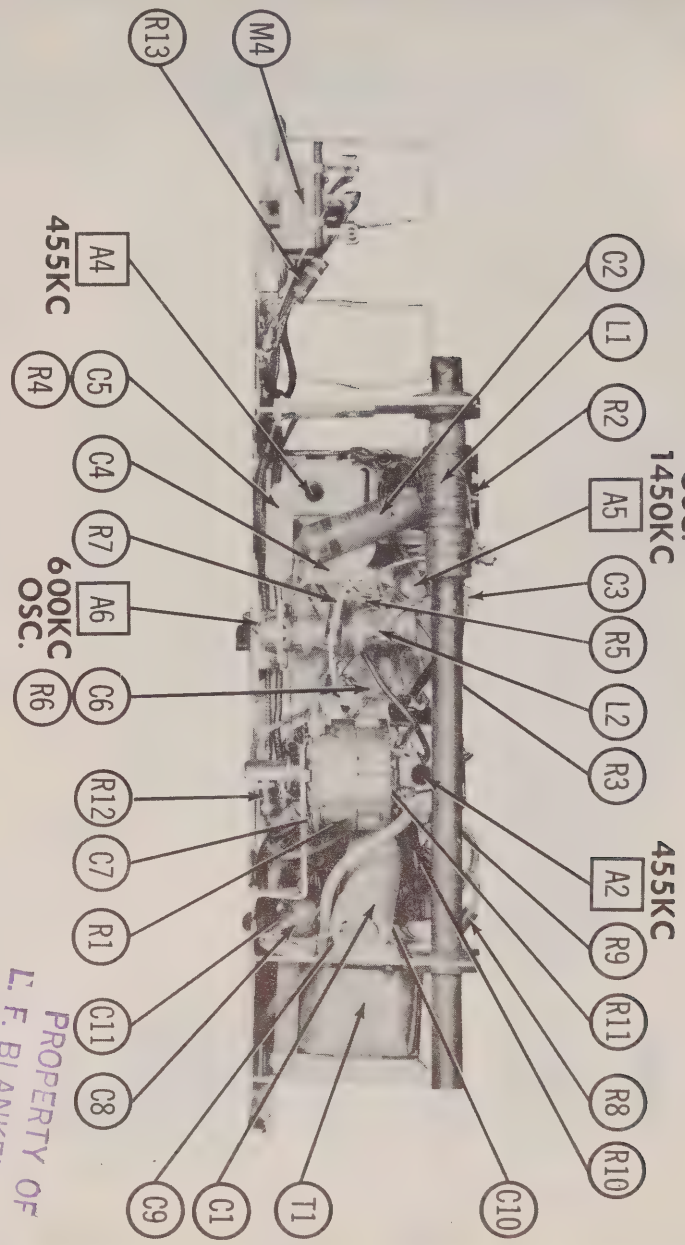
BATTERIES

ITEM No.	VOLTAGE	SYLVANIA PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	1.5V		964			2IR			Two used in parallel
M2	67.5V			477			P45		

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	Tuning cap	170-0013	(15-185MMF, 12-110MMF)
M4	Switch	572-0005	Battery saver
	Cabinet	822-0007	Driftwood-Model 454BR
	Cabinet	822-0009	Leaf green-Model 454GR
	Cabinet	822-0005	Ivory- Model 454H
	Cabinet	822-0011	Cherry-Model 454RE
	Back cover	822-0008	Model 454BR
	Back cover	822-0010	Model 454GR
	Back cover	8220006	Model 454H
	Back cover	822-0012	Model 454RE
	Knob	744-0027	Volume - Model 454BR
	Knob	744-0028	Volume-454GR
	Knob	744-0026	Volume-454H
	Knob	744-0029	Volume-454RE
	Knob	740-0054	Tuning-454BR
	Knob	740-0055	Tuning-454GR
	Knob	740-0053	Tuning-454H
	Knob	740-0056	Tuning-454RE

CHASSIS—BOTTOM VIEW



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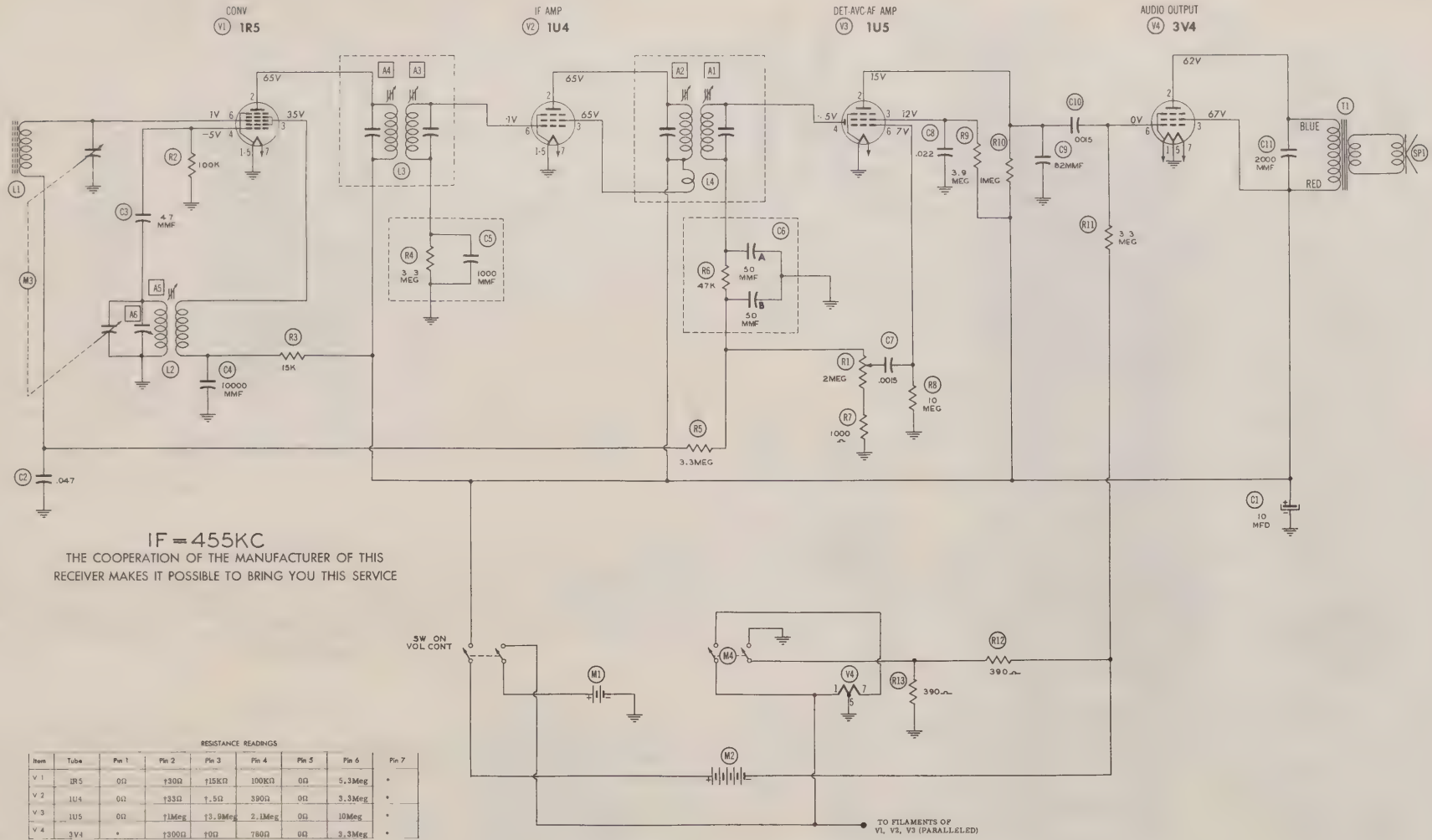
DENVER, COLORADO

SYLVANIA
MODEL 454BR, (Ch. 1-606-1)



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0Ω	†30Ω	†15KΩ	100KΩ	0Ω	5.3Meg	*
V 2	1U4	0Ω	†33Ω	†.5Ω	390Ω	0Ω	3.3Meg	*
V 3	1U5	0Ω	†1Meg	†3.9Meg	2.1Meg	0Ω	10Meg	*
V 4	3V4	*	†300Ω	†0Ω	780Ω	0Ω	3.3Meg	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM RED "B" BATTERY LEAD

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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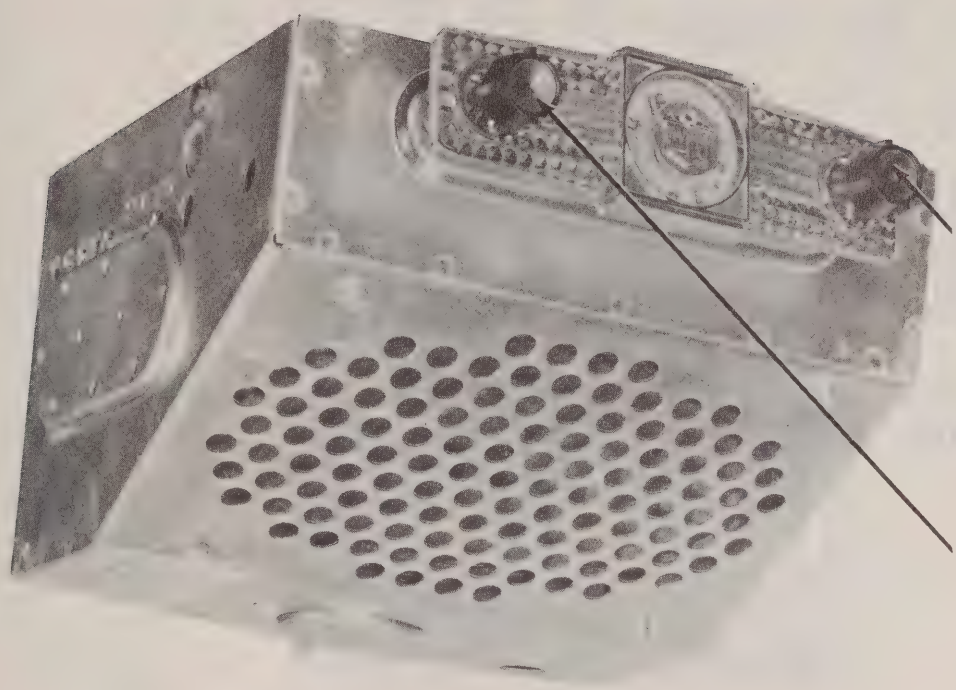
TRUETONE
MODEL D4320B



PROPERTY OF
E. F. BLANCHARD
3924 MEADE ST
DENVER, COLORADO

TRUETONE
MODEL D4320B

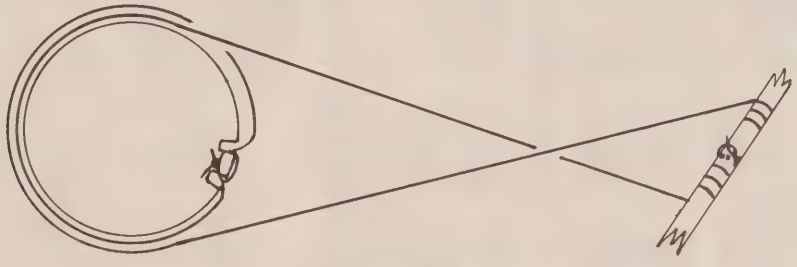
TRADE NAME	Truetone Model D4320B
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Battery Operated Universal Automobile Superheterodyne Receiver
TUBES (Six)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6AS5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.5 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
With tuning control fully clockwise, set dial pointer to the last index mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.	"	High side thru 50 MMF to antenna receptacle. Low side to chassis.	1300KC	Tune to 1300KC signal	"	A6, A7	"

NOTE: The entire tuning assembly is sealed and adjusted at the factory. If any individual part becomes defective the entire tuner unit should be replaced.



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PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D4320B

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BD6	6BD6	7BK	
V4	Det-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Output	6AS5	6AS5	7CV	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■30	200	8C-21726	AFH2-27		B022		FP310	TVL-2615	
B	▲20	200		PRS25/50		BR502			TVA-1206	
C	40	25								
C2	.047	200	8D-21823	P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C3	90		8F-21949							
C4	.0047	200	8D-21819	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C5	10		8G-19502							
C6	47		8G-12198	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C7	220	500	8F1-233	1468-00023		5W5T22		MCE240	1FM-325	
C8A	100		♦201-15005	♦PA-97	♦PC-50	♦111TM1	♦1403-01	UC-531	♦D-1	
B	100							UC-531		
C9	.01	200		P288-01	D6-103	PJ2S1	GP2-333-103	PT411	2TM-S1	
C10	.0047	200	8D-21819	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C11A	5000									
B	250		*17A-21742	*PA-112-1	*PC-70	*112TM1	*1406-01		*T-3	
C										
C12	.01	400	8D-21828	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C13	1000		8G-22721							
C14	.5	100	8D-19810	VHC-36		MP-2P5		RF-480	2TM-P5	
C15	.5	100	8D-19810	VHC-36		MP-2P5		RF-480	2TM-P5	
C16	.01	1000	8D-21836	P1088-01		CUB1051		PT1011	MB-S1	
C17	20000		8G-23344	BPD-02		K084				

♦ Items C8A, C8B and R9 are combined in one unit.
* Items C11A, C11B, C11C, R11A and R11B are combined in one unit.
When replacing items separately items C11B and C11C should total 250MMF.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	A-10-A-21722	Q18-133X	A47F-500K	AB-60	UT429	Volume tapped at 60KΩ
B	Shaft		Not Req.	NQ	RS-3/16	AK-8	DS-37	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R1A

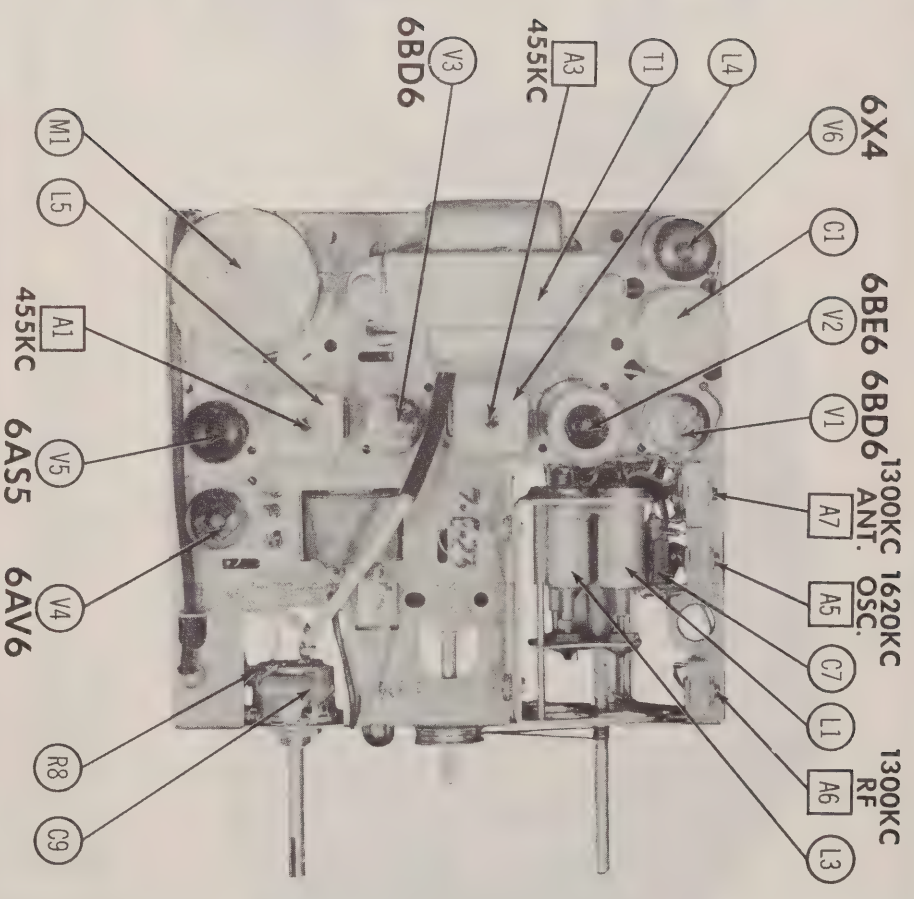
RESISTORS

ITEM No.	RATING OHMS	RATING WATT	TRUETONE PART No.	IRC PART No.	NOTES
R2	1 Meg	½	9B1-98	BTS-1 Meg	
R3	220Ω	½	9B1-54	BTS-220	
R4	1 Meg	½	9B1-98	BTS-1 Meg	
R5	2.2Meg	½	9B1-102	BTS-2.2Meg	
R6	47KΩ	½	9B1-82	BTS-47K	
R7	220Ω	½	9B1-54	BTS-220	
R8	22KΩ	½	9B1-78	BTS-22K	
R9	47KΩ	½	♦201-15005	BTS-47K	

ITEM No.	RATING OHMS	RATING WATT	TRUETONE PART No.	IRC PART No.	NOTES
R10	6.8 Meg	½	9B1-108	BTS-6.8Meg	
R11A	470KΩ	½	*17A-21742	BTS-470K	
B	470KΩ	½		BTS-470K	
R12	220Ω	½	9B1-54	BTS-220	
R13	1200Ω	2	9B4-63	BTB-1200	
R14	4700Ω	½	9B1-70	BTS-4700	
R15	68Ω	½	9B1-48	BTS-68	
R16	68Ω	½	9B1-48	BTS-68	

♦ Items R9, C8A, C8B are combined in one unit.
* Items R11A, R11B, C11A, C11B, C11C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6.3VCT @ 2.7A	360VCT .052ADC			12A-23524 12A-23321 ①					

① Alternate power transformer.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	4.6KΩ	3.3Ω	12C-21731						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	VIKING PART No.	QUAM PART No.	
SP1	4"x6"	PM	3.3Ω	18A22125	46J6	46A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	1Ω						Part of tuning assembly
L2	RF Coil	1Ω						Part of tuning assembly
L3	Osc. Coil	.5Ω	5.2Ω					Part of tuning assembly
L4	Input IF	1Ω	1Ω	13B-17731	16-6758	BC-352	12-C1	
L5	Output IF	1Ω	1Ω	13B-17731	16-6758	BC-353	12-C2	
L6	RF Filter Choke	1Ω		201-16379	19-3660		4650	640 Microhenries
L7	Fil. Choke	0Ω		16M-19921	19-1002	BC-537	5221	2.5 Microhenries
L8	Fil. Choke	0Ω		16M-19921	19-1002	BC-537	5221	2.5 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				TRUETONE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115∿	21B23296	5301	859	5342	

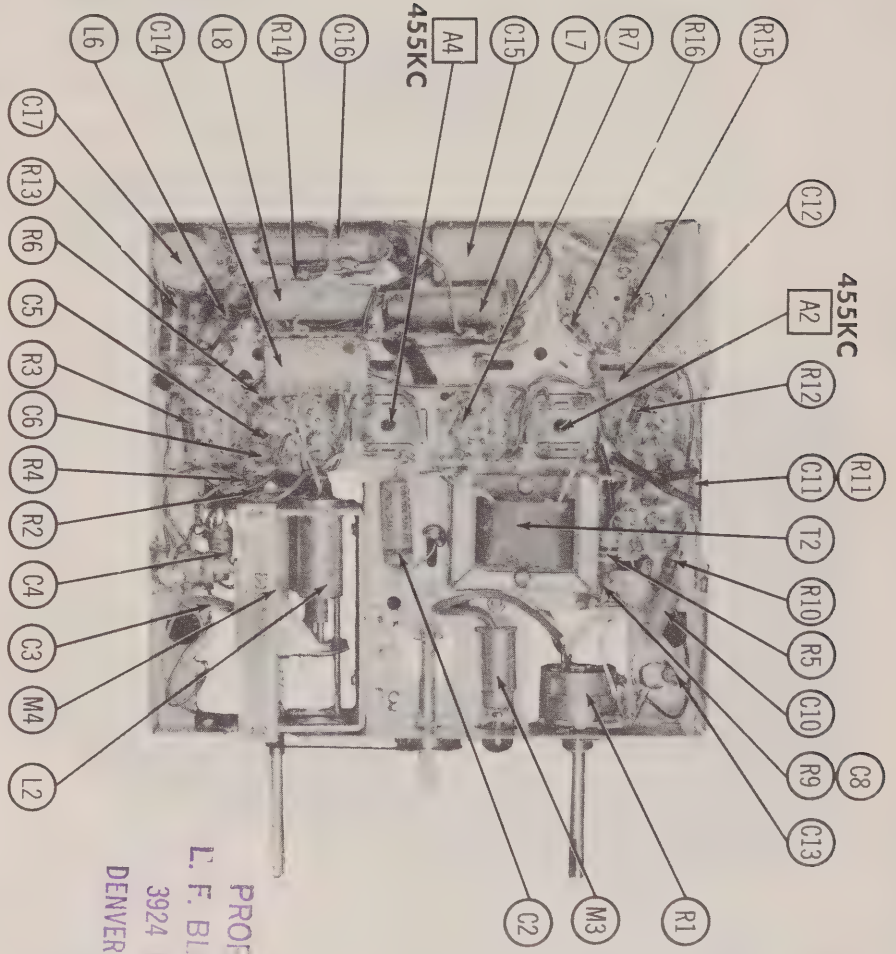
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			TRUETONE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	46B-17993		307014 (SFE-14A)	155014	SFE14	HDI

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Dial light	46A-11739	# 44 bayonet
M4	Tuning assembly	13F-21922	
A5 A6 A7	Trimmer cap	8E-21728	3 used
	Knob	200-23227	Assembly
	Dial scale	5M-21796	

CHASSIS—BOTTOM VIEW



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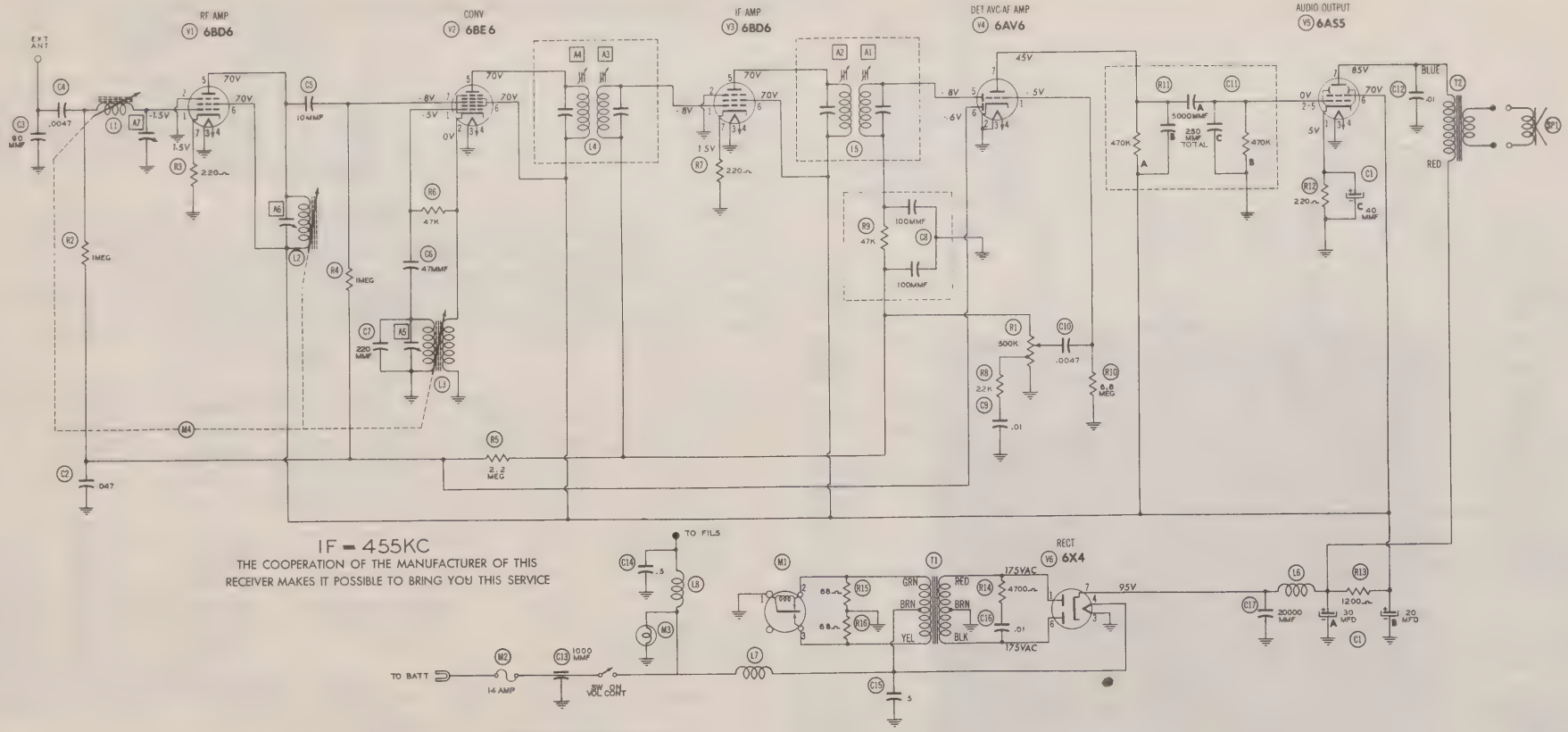
TRUETONE MODEL D4320B



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	3.7Meg	0Ω	0Ω	.1Ω	†1.2KΩ	†1.2KΩ	220Ω
V 2	6BE6	47KΩ	.6Ω	0Ω	.1Ω	†1.2KΩ	†1.2KΩ	3.7Meg
V 3	6BD6	2.7Meg	0Ω	0Ω	.1Ω	†1.2KΩ	†1.2KΩ	220Ω
V 4	6AV6	6.8Meg	0Ω	0Ω	.1Ω	550KΩ	2.7Meg	†470KΩ
V 5	6AS5	220Ω	470KΩ	0Ω	.1Ω	470KΩ	†1.2KΩ	†300Ω
V 6	6X4	240Ω	INF	0Ω	.1Ω	INF	210Ω	500KΩ

† MEASURED FROM PIN 7 OF V6

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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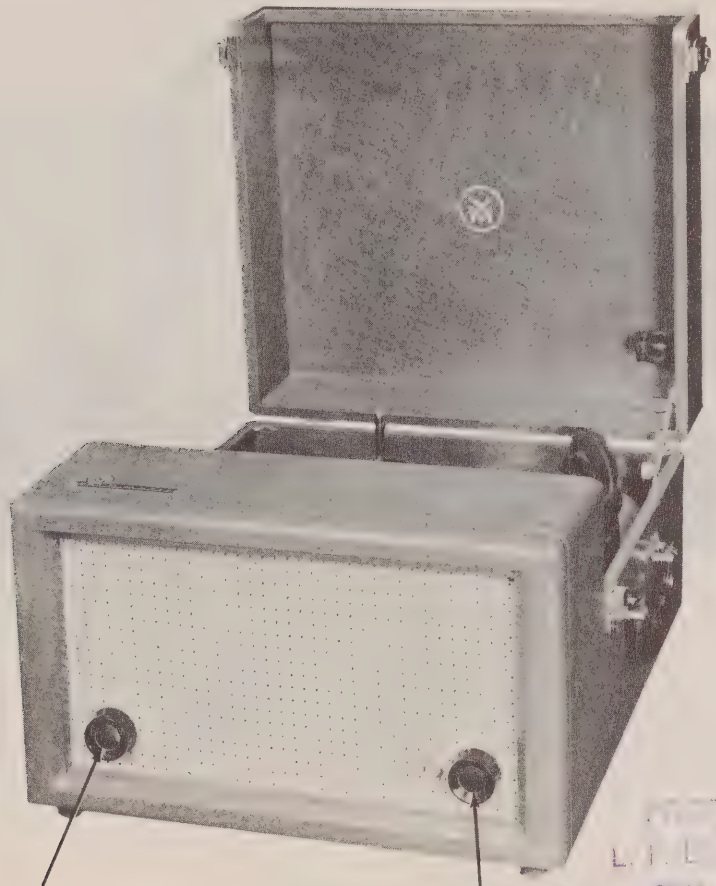
V-M
MODEL 986



PROPERTY OF
L.T.L. FELLOWSHIP
3921 MLADE ST.
DENVER, COLONADO

VOLUME CONTROL

TONE CONTROL

V-M
MODEL 986

TRADE NAME	V-M Model 986
MANUFACTUER	V-M Corp., Benton Harbor, Michigan
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AT6 AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .23 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - V-M MODEL 951 - SEE PHOTOFACT SET 216-FOLDER 11 OR RECORD CHANGER MANUAL CM-5.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		V-M PART No.	STANDARD REPLACEMENT		
V1	Phono Amplifier	12AT6	12AT6	7BT	
V2	Output	50C5	50C5	7CV	
V3	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	V-M PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	80	150		PRS150/80-40		BBRD8415		TCD498	R1274	Red
B	50	150								Yellow
C2	.047	400		P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C3	.0047	400		P488-0047	D6-472	PTE4D47	GP2-333-472	PT4247	4TM-D47	
C4	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C5&6	.022	400		P488-022	DD-203	PTE4S22		PT4122	4TM-S22	
C6	.003	400		P488-003	D6-302	PTE4D3	GP2-333-302	PT423	4TM-D3	
C7	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C8	.047	400		P488-047		PTE4S47		PT4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	V-M PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2 Meg	½	11959	Q11-139	A47-2Meg-S	AB-75	U-56	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2A	1 Meg	½	11960			ABT-74	UT-443	Volume tapped at 700K
B	Shaft		Not Req.			AK-4	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	V-M PART No.	IRC PART No.	
R3	100KΩ	½		BTS-100K	
R4	4.7Meg	½		BTS-4.7Meg	
R5	220KΩ	½		BTS-220K	Note 1
R6	220KΩ	½		BTS-220K	Note 1

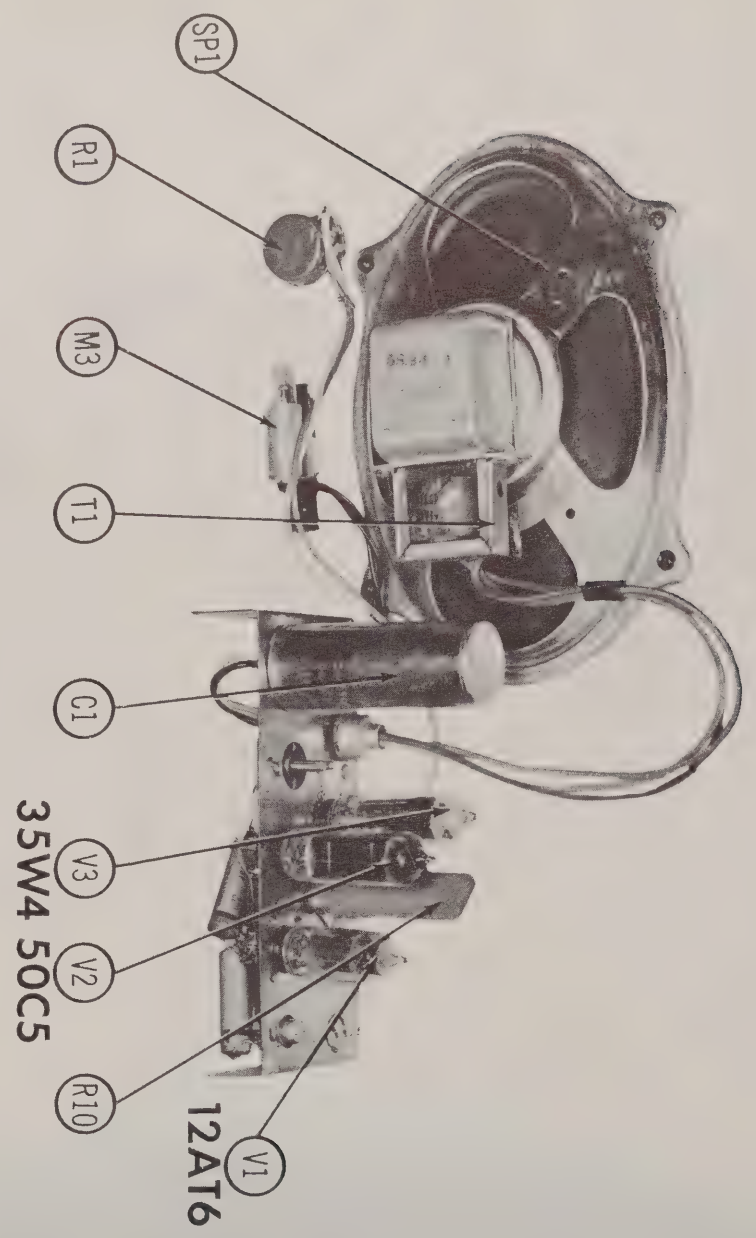
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	V-M PART No.	IRC PART No.	
R7	150Ω	½		BTS-150	
R8	1500Ω	½		BTS-1500	
R9	33Ω	1			
R10	120Ω	5			

Note 1. Some models may use a 270KΩ resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	V-M PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.8KΩ	3.5Ω	Part of Spkr.	A-3332	A-3025	S-1X ①	Z1101	TS-24S50A	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	V-M PART No.	VIKING PART No.	QUAM PART No.	
SP1	5 x 7"	PM	3.5Ω	5896	57J9	57A1	

PHONO CARTRIDGE

ITEM No	REPLACEMENT DATA						REMARKS
	V-M PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	VM2606	ACD-J	A-1 A-3	W22AB	A65MG A62A	96	0-1orS-1 and 0-3orS-3	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

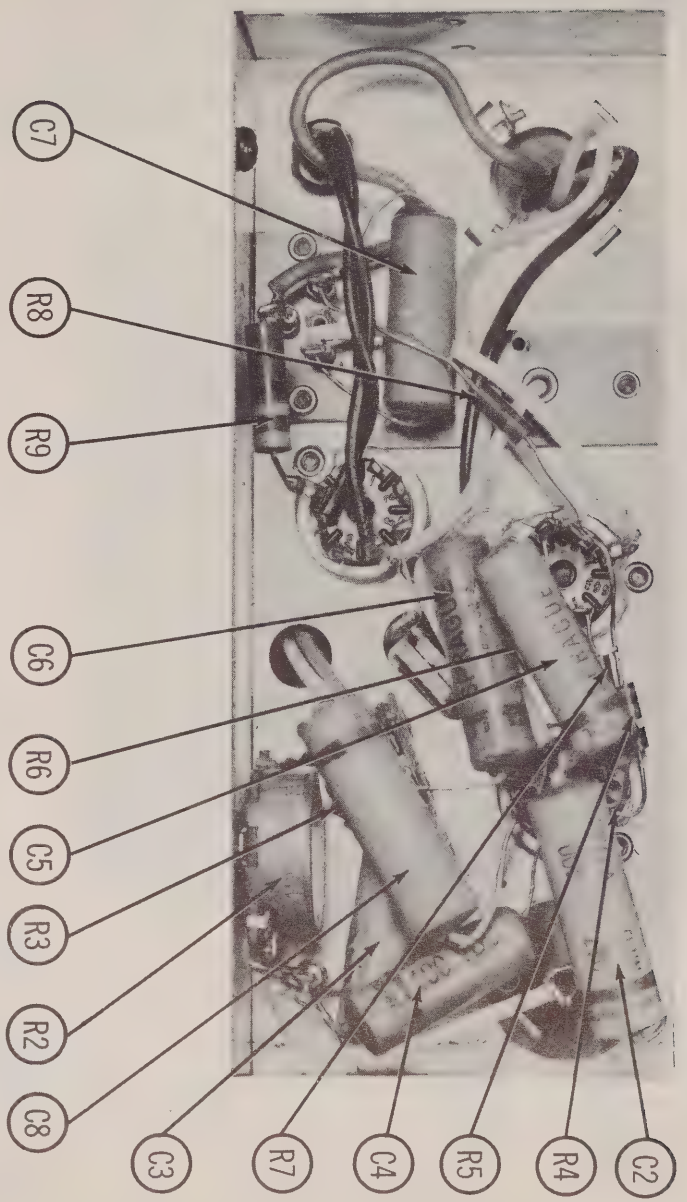
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	V-M PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2	(V-M 2629 78RPM needle) (V-M-2628 33 1/3-45RPM needle)	*JP-30 or †JPS-30 *JP-30LP or †JPS-30LP	*C-320 or †C-318 or ♦C-318D *A-322 or †A-300 ♦A-300D	*W-30A †W-30MGS	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M3	Dial light		# 47 bayonet
M4	Switch		Off-on reject

CHASSIS—BOTTOM VIEW



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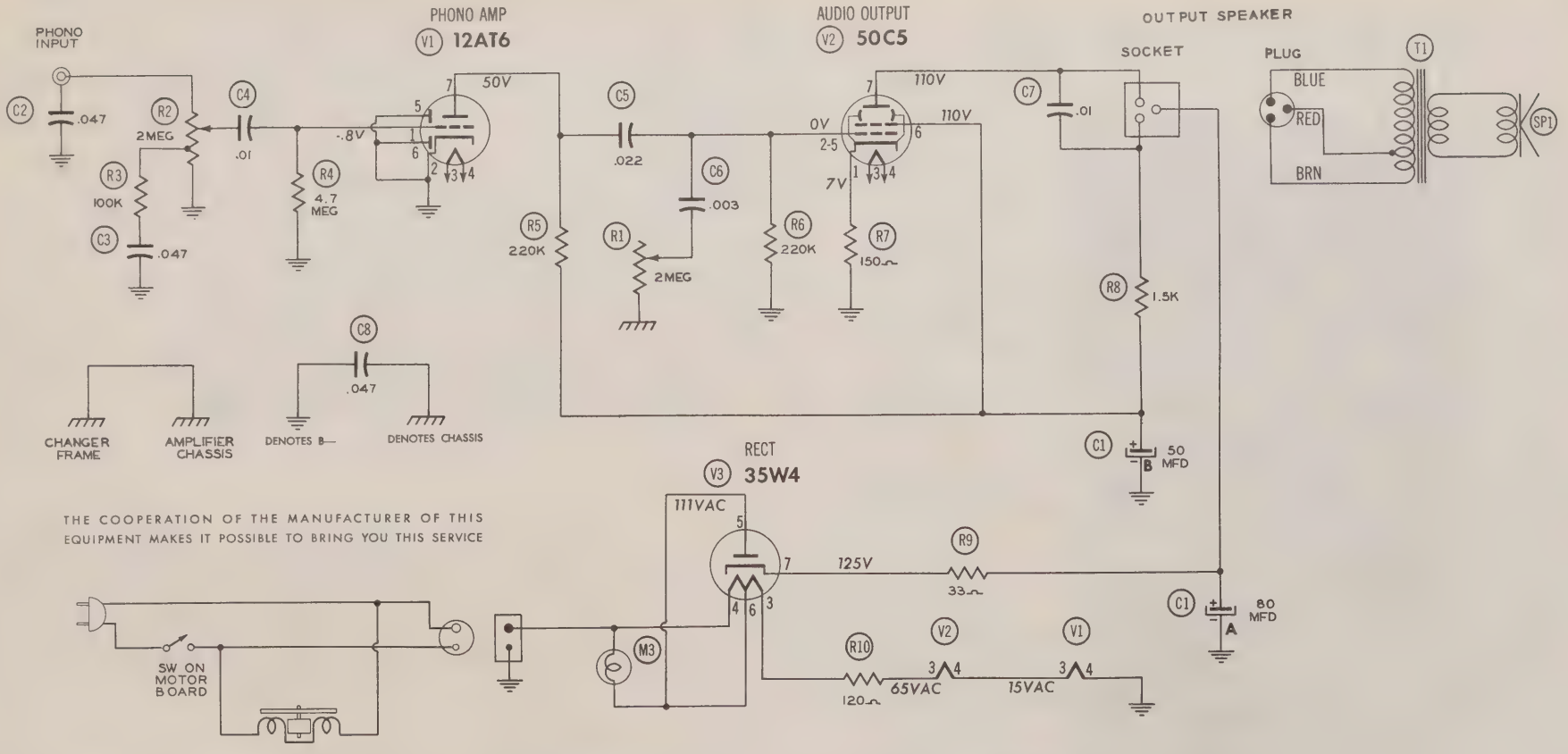
DENVER, COLORADO



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AT6	4.7Meg	0Ω	14Ω	0Ω	0Ω	0Ω	†270KΩ
V 2	50C5	150Ω	220KΩ	70Ω	14Ω	220KΩ	†1.5KΩ	†240Ω
V 3	35W4	INF	INF	200Ω	230Ω	225Ω	225Ω	100KΩ

† MEASURED FROM PIN 7 OF V3

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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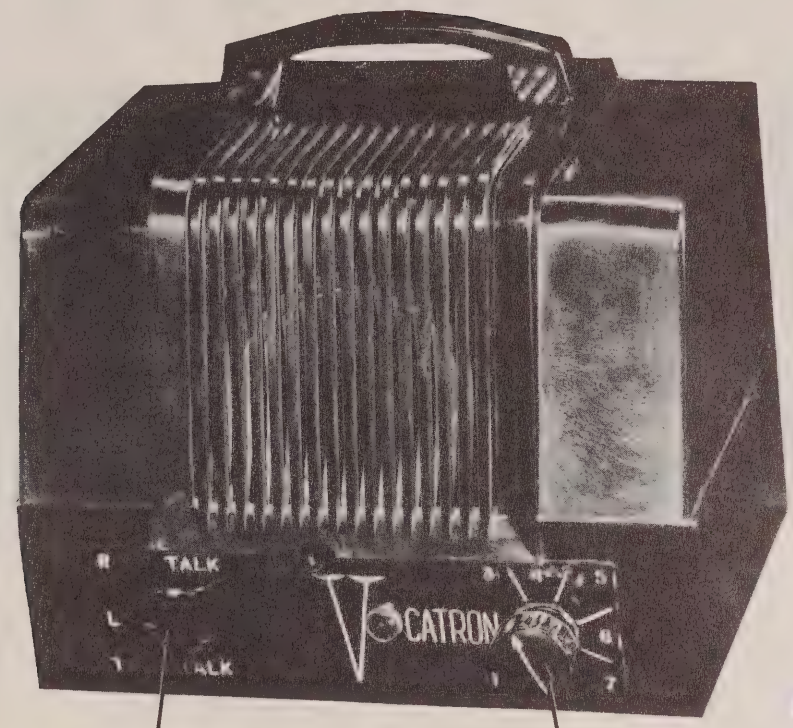
VOCATRON MODEL CC-45

VOCATRON MODEL CC-45



TALK LISTEN SWITCH

VOLUME CONTROL ON-OFF SWITCH

PROPERTY OF
L. F. SHANKENSHI
3924 MEADE ST.
DENVER, COLORADO

VOCATRON MODEL CC-45

TRADE NAME	Vocatron Model CC-45
MANUFACTURER	Electronics Div., Vocaline Co. of America, Old Saybrook, Conn.
TYPE SET	AC-DC Operated Wireless Intercommunication Unit
TUBES (Five)	Types 12AU6 Det.-Osc., 50B5 (or) 50C5 RF Amp., 12AU6 Speech Amp., 12AU6 AF Amp., 50B5 (or) 50C5 Audio Output-Modulator
POWER SUPPLY	105-125 Volts AC-DC — RATING .23 Amp. @ 117 Volts AC
TUNING RANGE	175KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Generator must be capable of ½ volt output across 10 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY		OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	Couple generator thru .05MFD to power line.	175KC (400%Mod)		Not used	A1	Adjust for maximum volume while attenuating signal generator for MINIMUM output.
2.	Use a second "Vocatron" unit as a monitor. Throw "talk-listen" switch of unit under test to "talk" position. With signal generator connected as in step 1, adjust A2 for zero beat as heard in the monitoring unit.						

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PARTS LIST AND DESCRIPTIONS

VOCATRON MODEL CC-45

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: VOCATRON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Oscillator-Detector	12AU6	12AU6	7BK	
V2A	RF Amplifier	50B5	50B5	7BZ	
B	RF Amplifier	50C5	50C5	7CV	Alternate - wiring change necessary
V3	Speech amplifier	12AU6	12AU6	7BK	
V4	AF Amplifier	12AU6	12AU6	7BK	
V5A	Audio Output-Modulator	50B5	50B5	7BZ	
B	Audio Output-Modulator	50C5	50C5	7CV	Alternate - wiring change necessary

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: VOCATRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■40	150	PE021	AFH3-10		C009		FP311.5	TVL-3440	
B	▲40	150								
C	40	150								
C2	.05	400	PE018	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3	.002	400	PE015	P488-002	D6-202	PTE4D2	GP2-333-202	PT422	4TM-D2	
C4	250	500	PE084	1469-00025		5R5T25		MCE236	1FM-325	
C5	250	500	PE084	1469-00025		5R5T25		MCE236	1FM-325	
C6	.002	400	PE015	P488-002	D6-202	PTE4D2	GP2-333-202	PT422	4TM-D2	
C7	.05	400	PE018	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C8	100	500	PE014	1468-0001		5W5T1		MC235	MS-31	
C9A	220									
B	5000									
C	5000		♦PE-089	♦PA-113-1	♦PC-150		♦1408-01		♦103C4	
D	250									
E	250									
C10	.1	400	PE019	P488-1	DF-104	PTE4S1		PT401	4TM-P1	
C11	.05	400	PE018	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C12	.01	600	PE016	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C13	.1	600	PE088	689ZX-1		PJ6P1		PT601	6TM-P1	
C14	.25	600	PE020	P688-25		PTE6P25		PT6025	6TM-P25	
C15	.05	400	PE018	P488-05		PTE4S5		PT415	4TM-S5	

♦ Items C9A, C9B, C9C, C9D, C9E, R15A, R15B and R15C are combined in one unit.
When replacing items separately items C9D and C9E should 250MMF.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: VOCATRON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	PE-013	Q13-133	AG-60-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

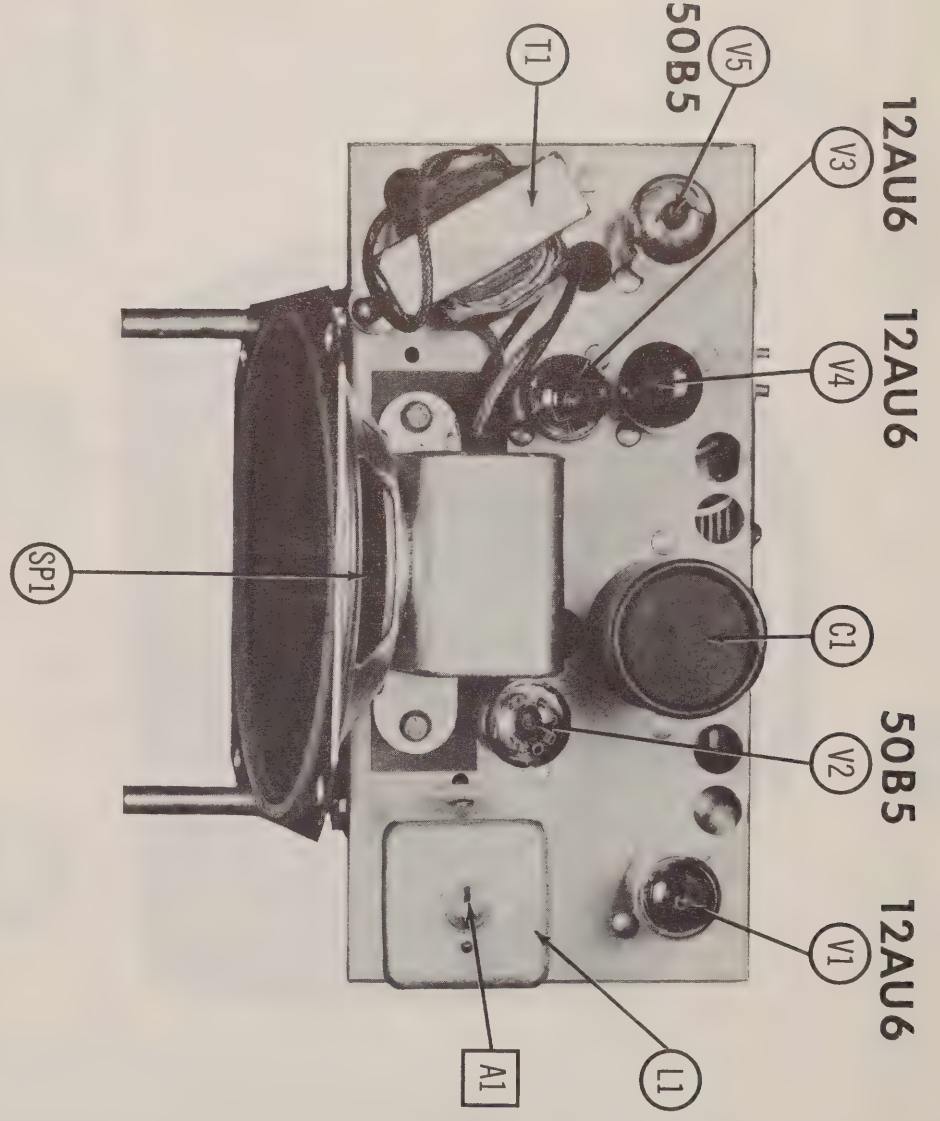
RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: VOCATRON PART No.	IRC PART No.	NOTES
R2	470Ω	½	PE081	BTS-470	
R3	470Ω	½	PE081	BTS-470	
R4	47KΩ	½	PE082	BTS-47K	
R5	270K	½	PE008	BTS-270K	
R6	100KΩ	½	PE083	BTS-100K	
R7	470Ω	½	PE081	BTS-470	
R8	150Ω	½	PE009	BTS-150	
R9	1 Meg	½	PE003	BTS-1 Meg	
R10	3300Ω	½	PE004	BTS-3300	
R11	1 Meg	½	PE003	BTS-1 Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: VOCATRON PART No.	IRC PART No.	NOTES
R12	22KΩ	½	PE005	BTS-22K	
R13	470KΩ	½	PE006	BTS-470K	
R14	470KΩ	½	PE006	BTS-470K	
R15A	10 Meg	½	♦ PE-089	BTS-10 Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R16	150Ω	½	PE009	BTS-150	
R17	2200Ω	½	PE010	BTS-2200	
R18	470Ω	2	PE011	BTB-470	
R19	82Ω	2	PE012		
R20	47KΩ	½	PE082	BTS-47K	

♦ Items R15A, R15B, R15C, C9A, C9B, C9C, C9D, C9E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	VOCATRON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.2KΩ	3.3Ω	PE023	A-3876	A-2928	S-2X	Z1002		

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	VOCATRON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	PE024	ST-113 Mod P4-X	4A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	VOCATRON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Osc. Coil	40Ω	40Ω	PE-086				Link winding= .1Ω
L2	RF Coil	40Ω	.2Ω	PE-091				

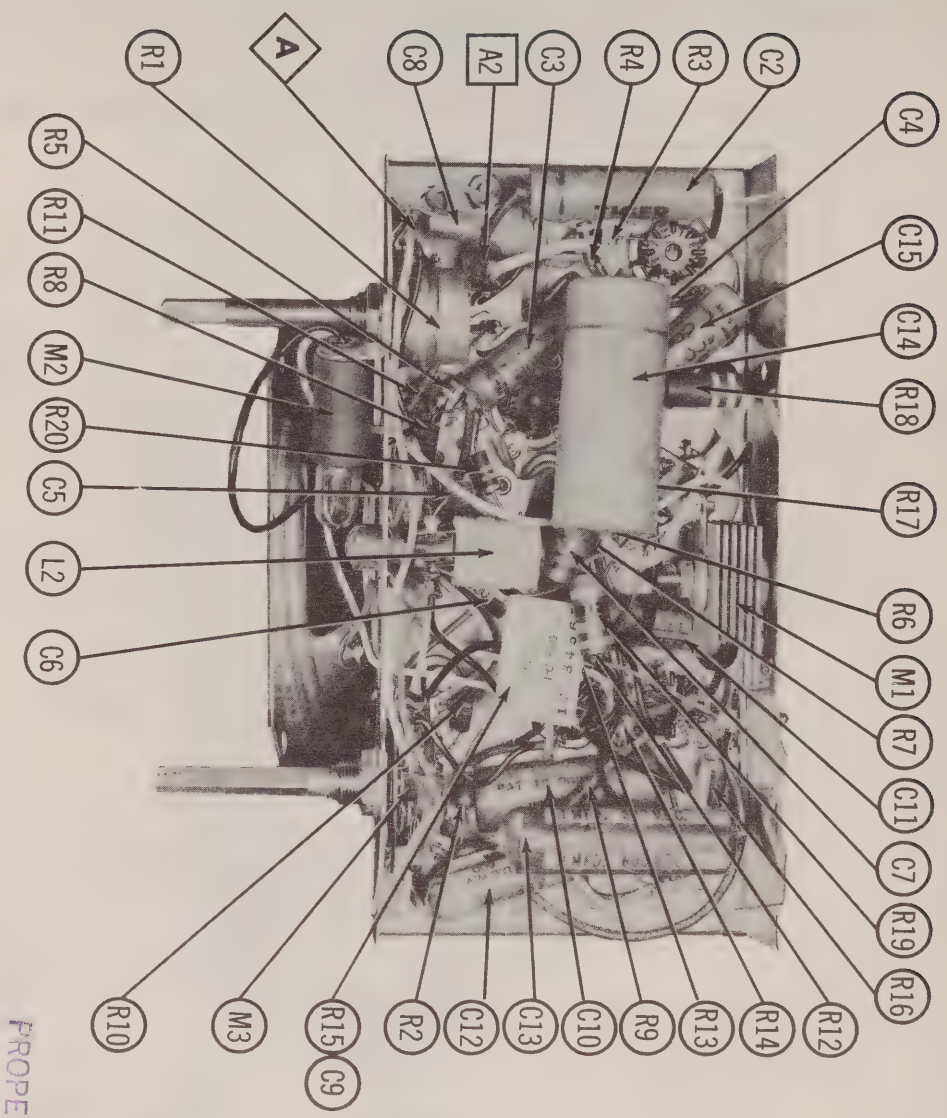
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	VOCATRON PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.062A	PE024	1003	RS75	6S75	75	5M4	

MISCELLANEOUS

ITEM No.	PART NAME	VOCATRON PART No.	NOTES
M2	Dial light		# 51 bayonet neon bulb
M3	Switch	PE-026	Talk-listen

CHASSIS—BOTTOM VIEW



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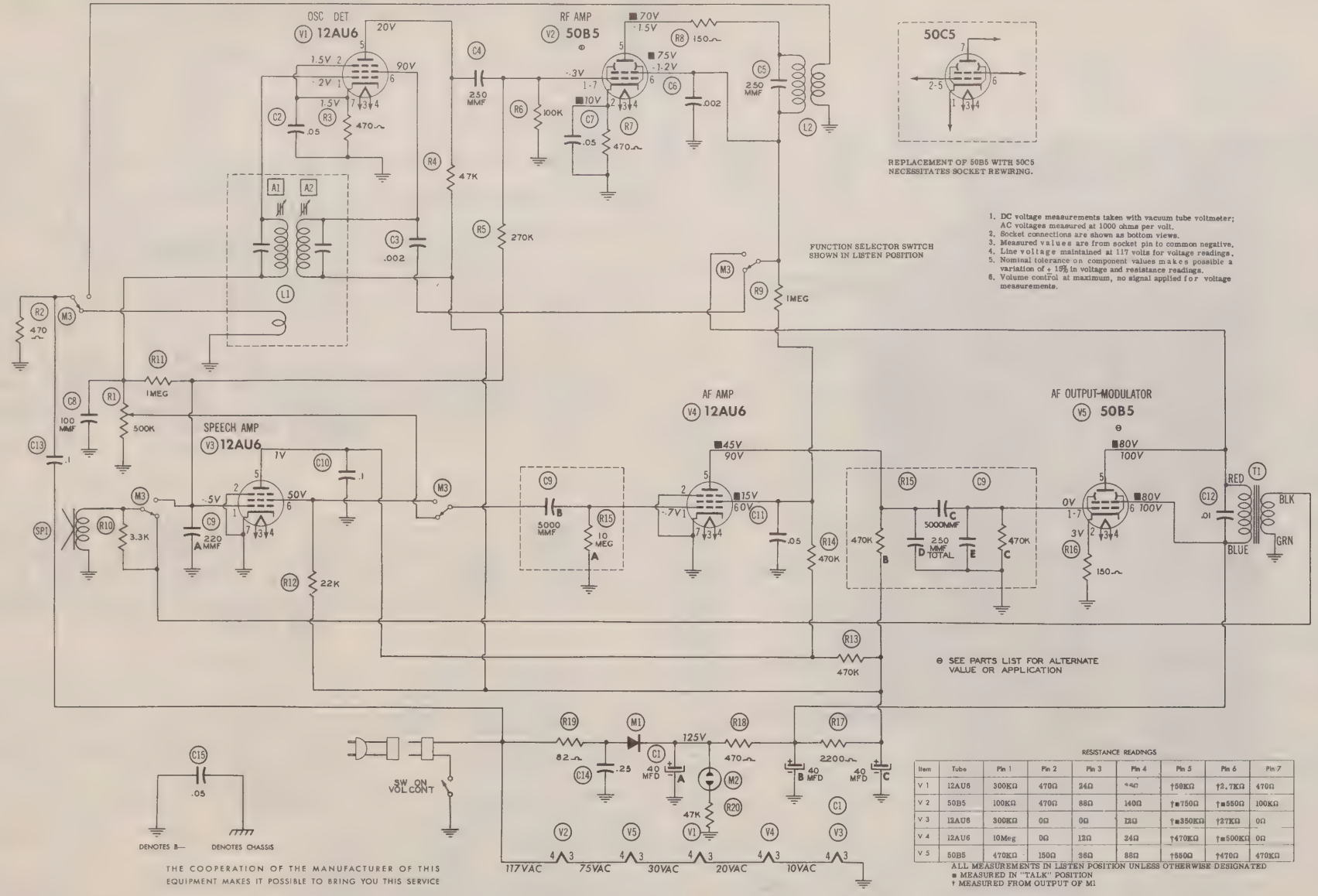
OSC DET
V1 12AU6
RF AMP
V2 50B5
AF AMP
V4 12AU6
AF OUTPUT-MODULATOR
V5 50B5
SPEECH AMP
V3 12AU6
50C5
REPLACEMENT OF 50B5 WITH 50C5 NECESSITATES SOCKET REWIRING.
FUNCTION SELECTOR SWITCH SHOWN IN LISTEN POSITION
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
SW ON VOL CONT
DENOTES B—
DENOTES CHASSIS
117VAC
75VAC
30VAC
20VAC
10VAC
RED
BLK
GRN
BLUE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	300KΩ	470Ω	24Ω	°4Ω	†50KΩ	†2.7KΩ	470Ω
V 2	50B5	100KΩ	470Ω	88Ω	140Ω	†■750Ω	†■550Ω	100KΩ
V 3	12AU6	300KΩ	0Ω	0Ω	12Ω	†■350KΩ	†27KΩ	0Ω
V 4	12AU6	10Meg	0Ω	12Ω	24Ω	†470KΩ	†■500KΩ	0Ω
V 5	50B5	470KΩ	150Ω	36Ω	88Ω	†550Ω	†470Ω	470KΩ

ALL MEASUREMENTS IN LISTEN POSITION UNLESS OTHERWISE DESIGNATED
■ MEASURED IN "TALK" POSITION
† MEASURED FROM OUTPUT OF M1

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ZENITH
MODELS S-9011, S-9012 (Ch. 3L01)

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L. F. BLANKENSHIP
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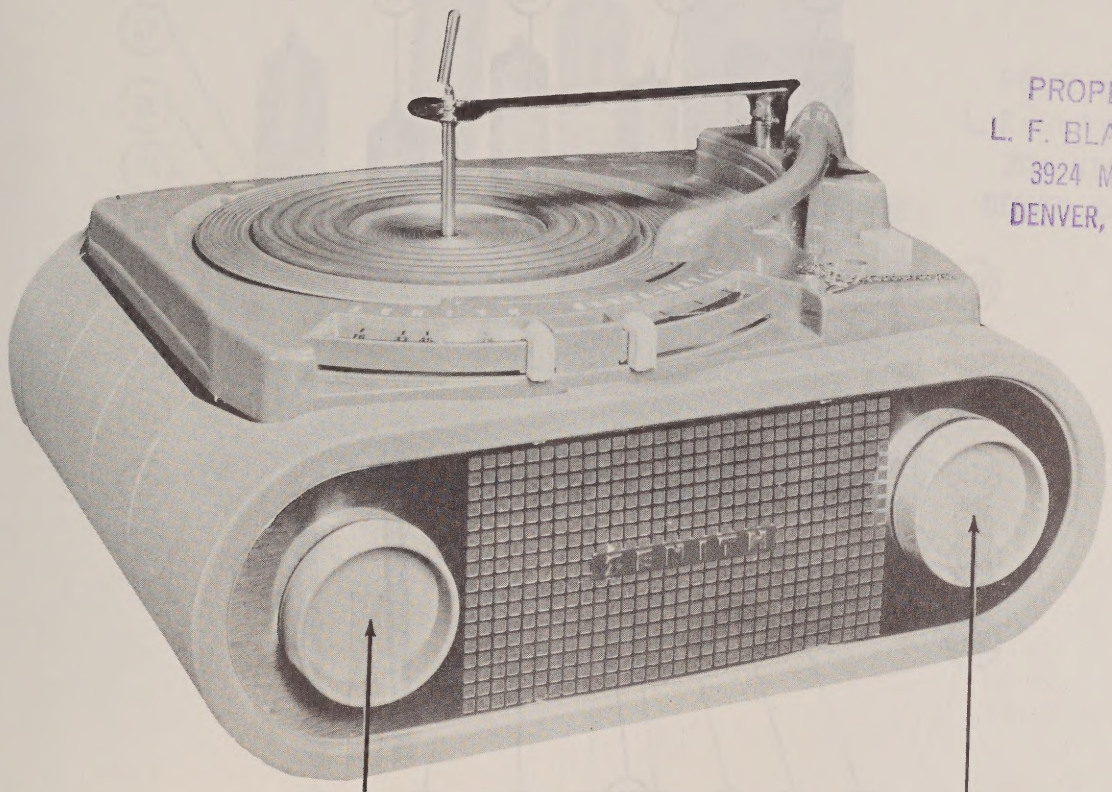
DENVER, COLORADO



ZENITH
MODELS S-9011, S-9012 (Ch. 3L01)

TRADE NAME	Zenith Models S-9011, S-9012 (Ch. 3L01)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Record Changer
TUBES (Three)	Types 12AU6 AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .22 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON ZENITH RECORD CHANGER S-14053 - SEE PHOTOFACT SET #226, FOLDER #13.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ZENITH PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	12AU6	12AU6	7BK	
V2	Output	50C5	50C5	7CV	
V3	Rectifier	35W4	35W4	6BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲60	150	22-2442	AFH4-46		D038		FP419.7	TVL-4570	
B	■40	150								
C	▲20	150								
D	20	25								
C2	10000		22-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C3	10000		22-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C4	.002	200	22-1710	P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C5	.001	600	22-1203	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C6	.1	400	22-825	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C7	10000		22-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C8	.006	600	22-458	P688-006	D6-602	CUB6D6	GP2-333-602	PT626	6TM-D6	
C9	470		22-6	BPD-00047	D6-471	K060	821-471	UC-5347	5GA-T47	
C10	.01	400	22-1846	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C11	10000		22-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C12	10000		22-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	63-2904	Q19-133X			UT-431	Volume tapped @ 260K
B	Shaft		Not Req.	C3			DS-36	Attach to R1A
C	Switch		Not Req.	76-1			US-26	Attach to R1A
R2	1 Meg	½	63-2905	Q14-137			U54	Tone

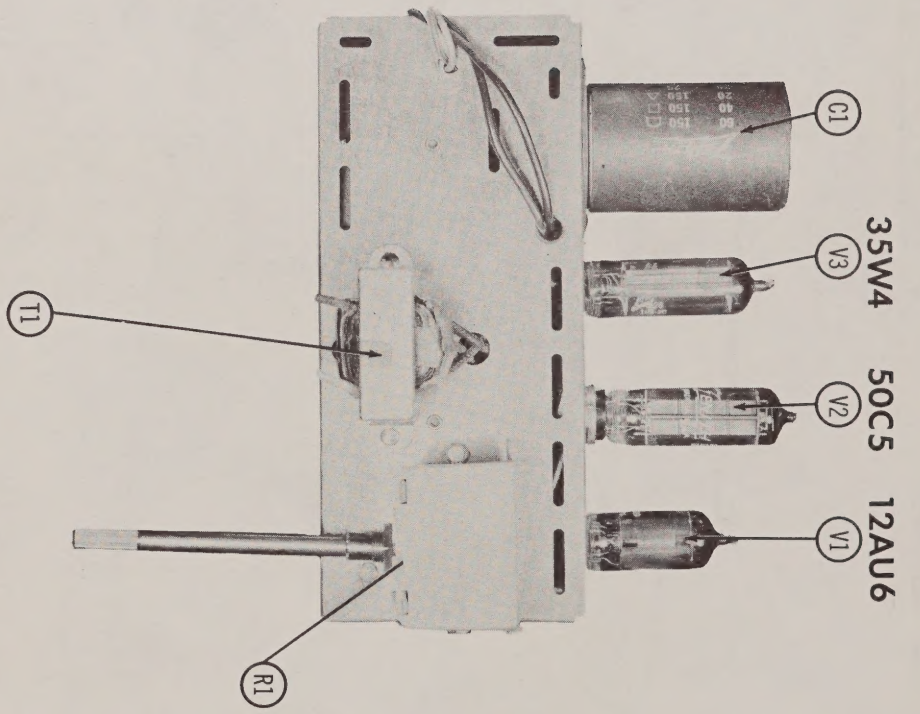
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R3	4.7Meg	½	63-1940	BTS-4.7Meg	
R4	3.3Meg	½	63-1933	BTS-3.3Meg	
R5	1200Ω	½	63-1789	BTS-1200	
R6	120KΩ	½	63-1873	BTS-120K	
R7	68KΩ	½	63-1862	BTS-68K	
R8	22KΩ	½	63-1842	BTS-22K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R9	1 Meg	½	63-1912	BTS-1 Meg	Note
R10	150Ω	½	63-1750	BTS-150	
R11	6800Ω	½	63-1821	BTS-6800	
R12	1500Ω	½	63-1792	BTS-1500	
R13	22Ω	½	63-1219	BTS-22	
R14	150Ω	5	63-2767	1 3/4A-150	

Note - Some models may use a 680KΩ resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	24KΩ	3.3Ω	95-1365	A-3336	A-3031		Z1102	TS-24S50A	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3.3Ω	49-747	ST-803 Mod. P525-V	52A1	

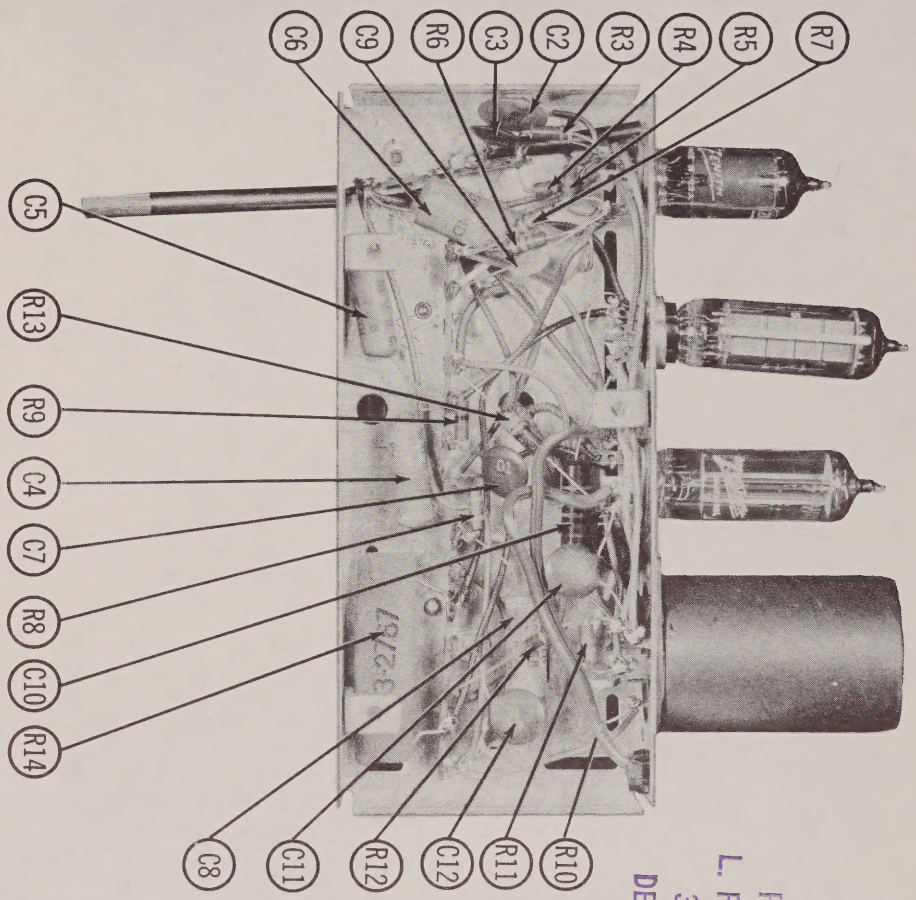
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	ZENITH PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	142-72							

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
	Cabinet	14-1619	Metal
	Knob	46-1204	(2) volume & tone

CHASSIS—BOTTOM VIEW



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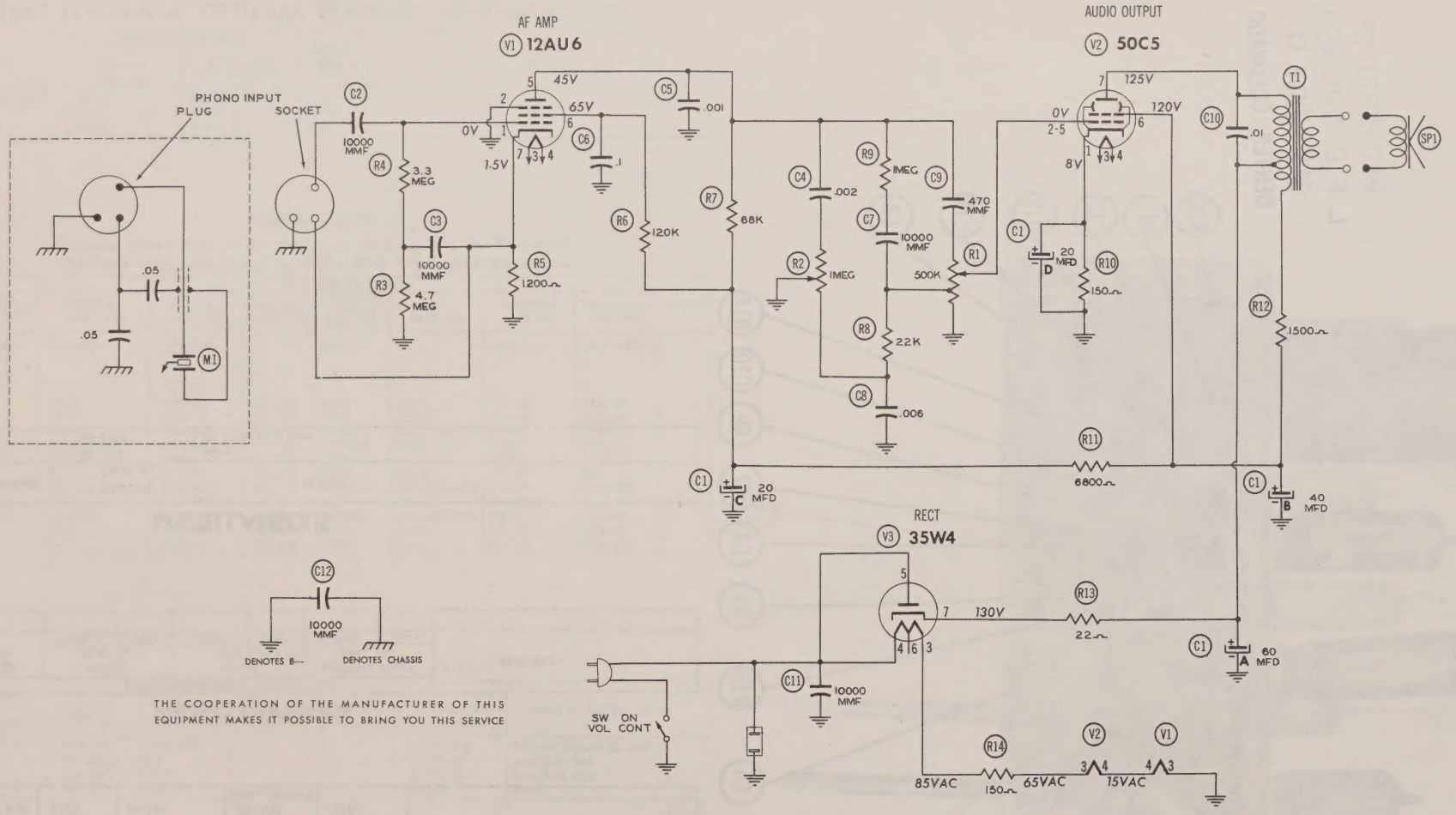
ZENITH
MODEL S-901L, (Ch. 3L01)



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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	8Meg	0Ω	0Ω	14Ω	†75KΩ	†130KΩ	1.2KΩ
V 2	50C5	150Ω	200KΩ	75Ω	14Ω	200KΩ	†1.5KΩ	†200Ω
V 3	35W4	INF	0Ω	225Ω	260Ω	260Ω	250Ω	100KΩ

† MEASURED FROM PIN 7 OF V3

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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